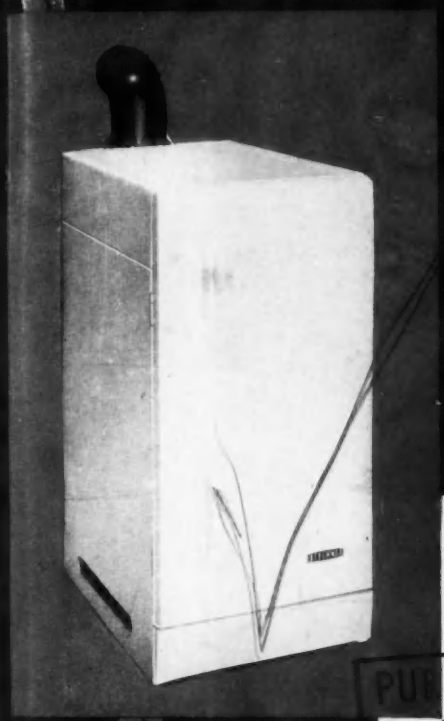
TECHNOLOGY DEPT.

Gas Journal

VOL. 284. 107th YEAR. LONDON, NOVEMBER 9, 1955. Nº 4823. PRICE 1/6

A model of self-control



Here, at last, is a really good domestic gas-fired boiler—the "Diplomat". With an output of 44,000 B/Th/U per hour it meets the needs of the average household and is handsome enough to grace the most modern kitchen. It is made with the high efficiency, dependability and good workmanship that is a tradition with all "Potterton" boilers and is supremely simple to install and to service. There is undoubtedly a market for such a boiler for there are thousands of people who are willing to pay for the comfort and convenience of gas-fired central heating and hot water supply. For such people, the "Diplomat" is the *automatic* choice.

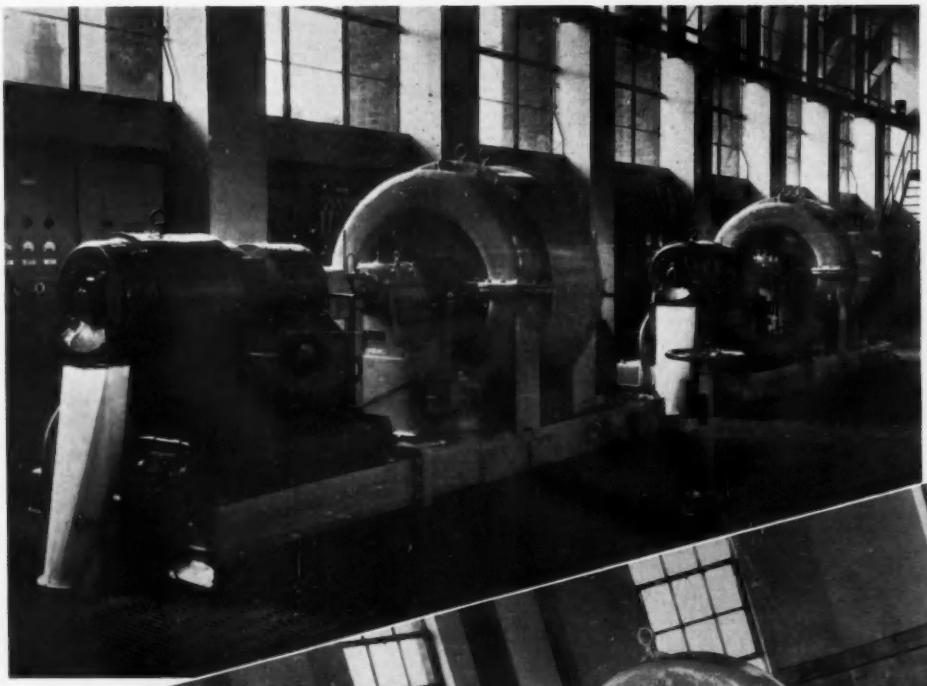
PUBLIC LIBRARY DEC 1 1955 DETROIT

POTTERTON GAS FIRED BOILERS MADE BY DE LA RUE

THOMAS DE LA RUE & CO LTD (POTTERTON DIVISION) 20/30 Buckhold Rd., London, S.W.18.

GAS BOOSTERS & EXHAUSTERS

AT SWAN VILLAGE NEW GAS WORKS—WEST MIDLANDS GAS BOARD



2—900 m.m. THREE STAGE TURBO EXHAUSTERS. EACH MACHINE WITH A CAPACITY OF 415,000 CUB. FT. GAS PER HR. AGAINST PRESSURE DIFF. 53" W.G. RUNNING AT 2,830 r.p.m.

DRIVEN BY A 120 H.P. ELECTRIC MOTOR THROUGH FLUID COUPLING.

Illustrations by courtesy of W.M.G.B.

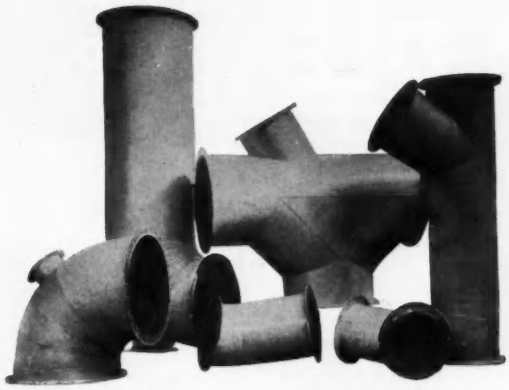
1—1,200 m.m. SINGLE INLET TURBO BOOSTER CAPACITY 900,000 CUB. FT. GAS PER HR. AGAINST PRESSURE DIFF. 44" W.G. RUNNING AT 2,860 r.p.m. DRIVEN BY A 185 H.P. ELECTRIC MOTOR THROUGH FLUID COUPLING.

THE BRYAN DONKIN COMPANY LTD., CHESTERFIELD

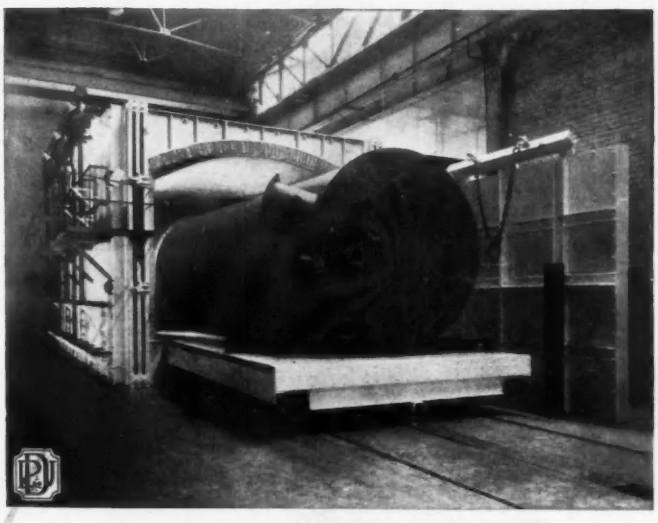
MEMBER OF THE SOCIETY OF BRITISH GAS INDUSTRIES

WELDED STEELWORK
and
HEAT TREATMENT
by

(The hallmark of high quality plant)

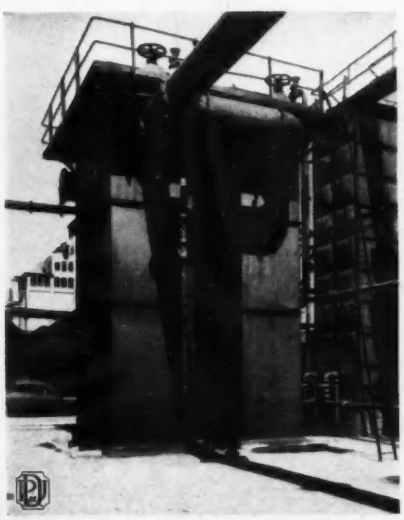


MISCELLANEOUS WELDED PIPES



OUR HEAT TREATMENT AND STRESS RELIEVING FURNACE

Note:—This gas-heated furnace will accommodate welded steel mains, pressure vessels and other components up to 20 tons in weight and, in special circumstances, up to 52 feet in length. Efficient temperature control is provided, and the operating temperature is 0°C to 800°C.



WELDED STEEL CONDENSERS

Our welded steel products include:- BY-PRODUCT and CHEMICAL PLANT · CONDENSERS · DE-TARRERS · GAS-HOLDERS · GAS CONNECTIONS · PURIFIERS · STILLS · TANKS · WASHERS, etc.

Your enquiries and orders will be welcomed by:—

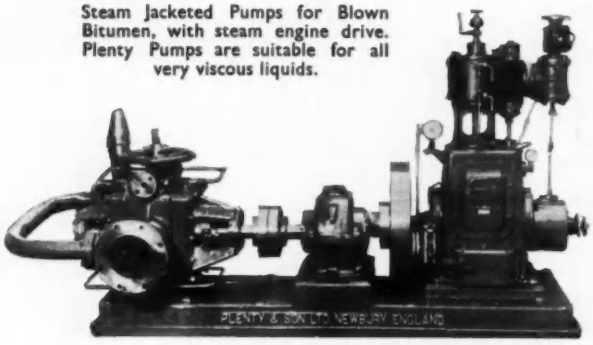
R. & J.
DEMPSTER
Limited
Constructional Gas & Chemical Engineers
GAS PLANT WORKS · NEWTON HEATH
MANCHESTER · 10

London Office : 34, VICTORIA STREET, S.W.1.

A

PLENTY Rotary Pumps

Steam Jacketed Pumps for Blown Bitumen, with steam engine drive. Plenty Pumps are suitable for all very viscous liquids.



- IDEAL FOR COAL-OIL CONVERSION
- INFINITELY VARIABLE FLOW CONTROL TO SUIT ANY VISCOSITY
- ELECTRIC AND PNEUMATIC REMOTE SEQUENCE CONTROLS AVAILABLE
- ALL SIZES UP TO 750 Tons/Hour
- PRESSURES UP TO 350 lbs./sq. inch.

Also makers of Steam-Jacketed and Constant Pressure Pumps, Proportioning, Remote Control and Servo operated pumps.

Write for the fullest details to:—

G.J.

Telephone: NEWBURY 7

Telegrams PLENTY, NEWBURY

PLENTY & SON Ltd

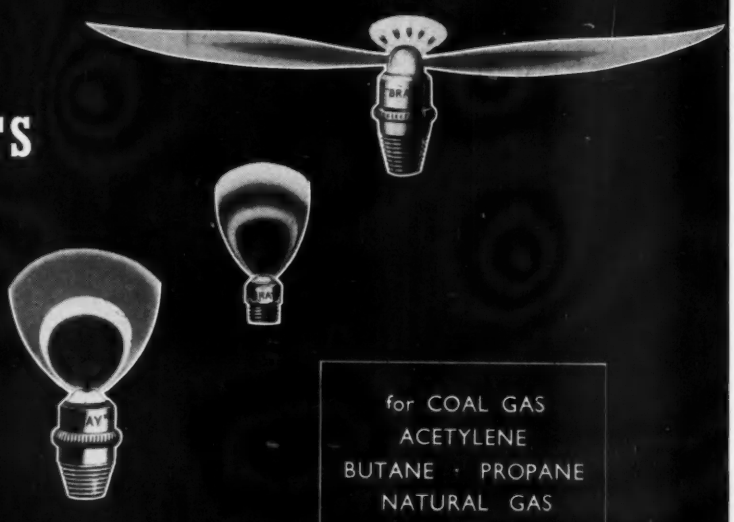
Marine Engineers & Pump Manufacturers

NEWBURY, Berks.

BRAY

NEAT GAS JETS

NON-ATMOSPHERIC AND ATMOSPHERIC TYPES



for COAL GAS
ACETYLENE
BUTANE · PROPANE
NATURAL GAS
METHANE Etc.

GEO. BRAY AND CO., LTD. LEICESTER PLACE, **LEEDS 2**

Tel. Leeds 20981/9

Grams. "Bray Leeds 2"

SCRAP for COHEN'S

COHEN'S for SCRAP

THE 600 GROUP OF COMPANIES

GEORGE COHEN
SONS AND COMPANY LIMITED

RAW MATERIALS DIVISION

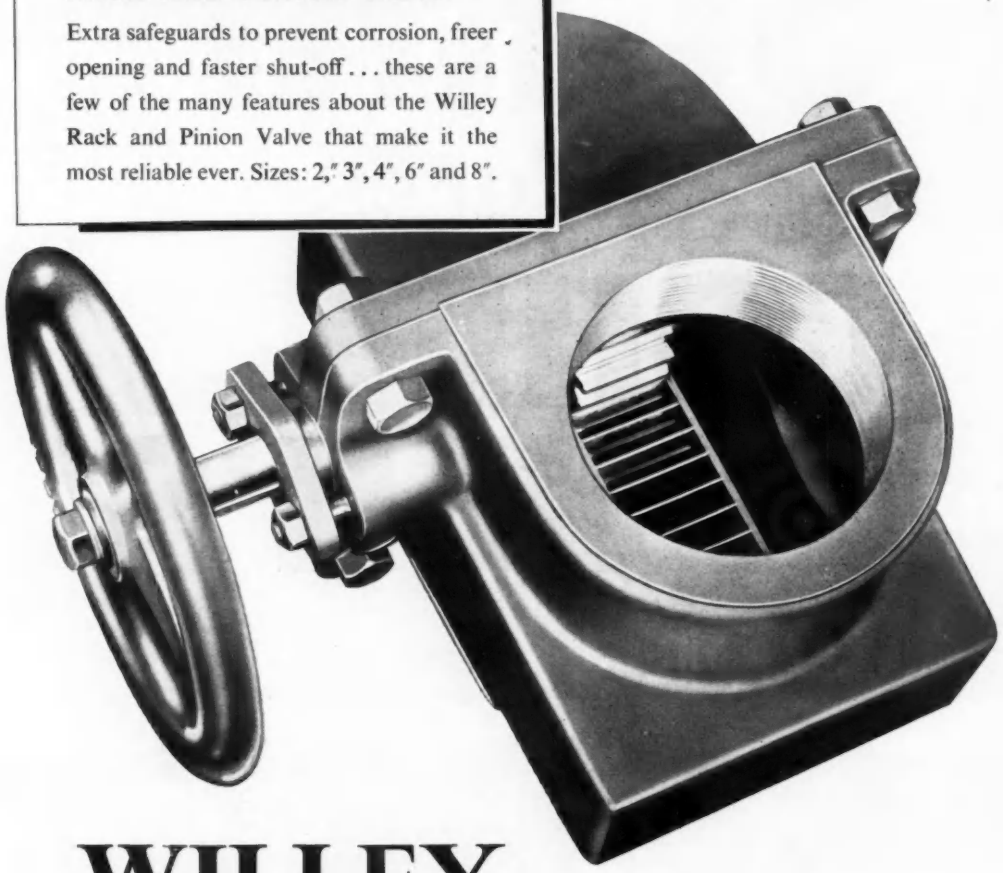
Experts in Scrap since 1834

BROADWAY CHAMBERS, LONDON, W.6 · *Telephone:* Riverside 4141 · *Telegrams:* Coborn, Telex, London
And at 600 Commercial Road, E.14 · Bidder Street, Canning Town, E.16 · Bath · Belfast · Birmingham
Hebburn-on-Tyne · Leeds · Luton · Manchester · Sheffield · Swansea

GCS/X

RACK AND PINION VALVE

Extra safeguards to prevent corrosion, freer opening and faster shut-off . . . these are a few of the many features about the Willey Rack and Pinion Valve that make it the most reliable ever. Sizes: 2," 3", 4", 6" and 8".



WILLEY
PRECISION VALVES

The Rack and Pinion Valve is a typical example of Willey precision castings. Pinion and buffers are made from a specially selected grade of corrosion-resisting bronze. The body seating is kept free from deposit by means of a coil spring action. Possibility of jamming has been virtually eliminated by precision machining of the pinion teeth. An extra-secure packing gland is incorporated, while precision-machined tapers ensure free opening and fast shut-off at all times. The 2", 3", 4" and 6" sizes are available with screwed or flanged ends.

OTHER FAMOUS WILLEY VALVES

Cast Iron control valves

Gate valves

Gunmetal steam wheel valves

Gunmetal handy valves

Three-way valves

GAS ENGINEERS

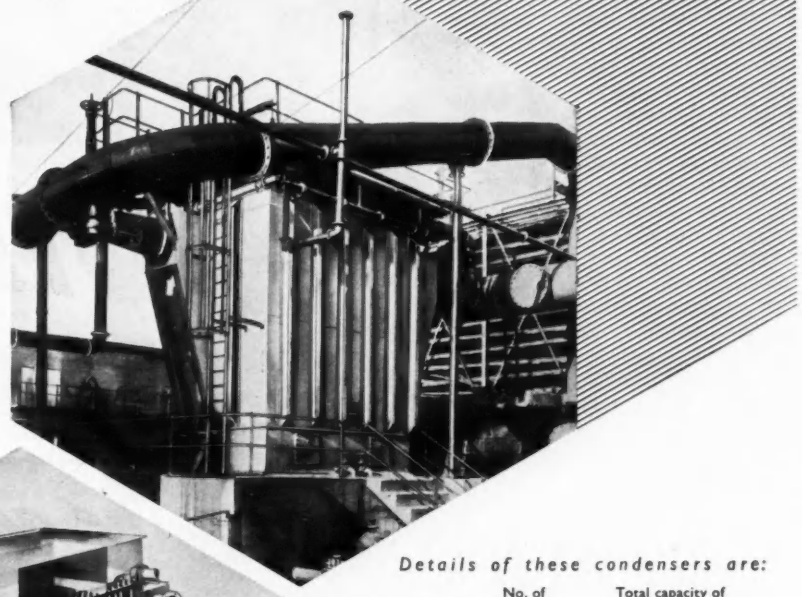
WILLEY & CO. LTD · EXETER · LONDON · MANCHESTER · LEICESTER · DARLINGTON

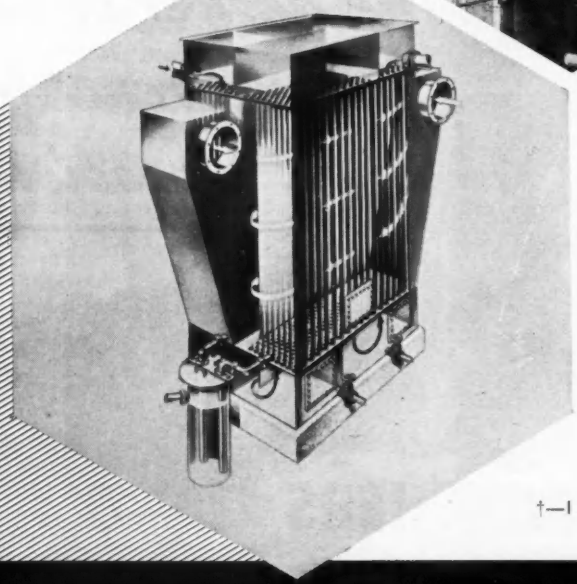
ASSOCIATED COMPANY OF UNITED GAS INDUSTRIES LIMITED

WHESSOE

CROSS FLOW CONDENSERS

So far seventeen Whessoe cross-flow condensers — the latest and most efficient unit for gas cooling—have been ordered, eight of which are already in operation. The total capacity of these condensers will be over 65 million cubic feet of gas per day.





Details of these condensers are:

	No. of condensers	Total capacity of condensing plant
ABERAVON -	2 (s)	6½ mill. cu.ft. per day
BOLTON - -	2 (s)	8 mill. cu.ft. per day
CONSETT - -	2 (p)	16 mill. cu.ft. per day†
DEVONPORT	1	2½ mill. cu.ft. per day*
GILLINGHAM	2 (s)	3 mill. cu.ft. per day
LINACRE - -	2 (p)	8 mill. cu.ft. per day*
NEEPSEND -	2 (p)	10 mill. cu.ft. per day
PAISLEY - -	2 (p)	8 mill. cu.ft. per day*
REDDITCH -	2 (p)	3½ mill. cu.ft. per day*

s—series p—parallel *—operating
†—1 condenser operating. Remainder building or on order.

WHESSOE FOR GAS TREATMENT AND STORAGE

An advertisement of Whessoe Ltd., Darlington, England. Telephone: Darlington 5315 · London office: 25 Victoria Street, London, S.W.1. Telephone: ABBey 3881

W58

PAXMAN

HIGH VELOCITY
ULTRANOMIC
ECONOMIC
STEEL SECTIONAL
HOT WATER
WASTE HEAT

BOILERS

Please write for Publication 1353

Davey, Paxman & Co. Ltd., Colchester, England

TELEPHONE : 5151 TELEGRAMS : PAXMAN, COLCHESTER

Paxman

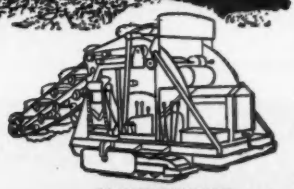
B.48

12/21 MODEL FOR NARROW TRENCHES

The answer to all your trenching problems

ALLEN *Super Duty* TRENCHERS

For narrow trenches we supply the 12/21 model, and for wide trenches the 16/60 model. Both models are a fine engineering job and capable of standing up to continuous hard work. We shall be pleased to send you further information and fully illustrated brochures on request.

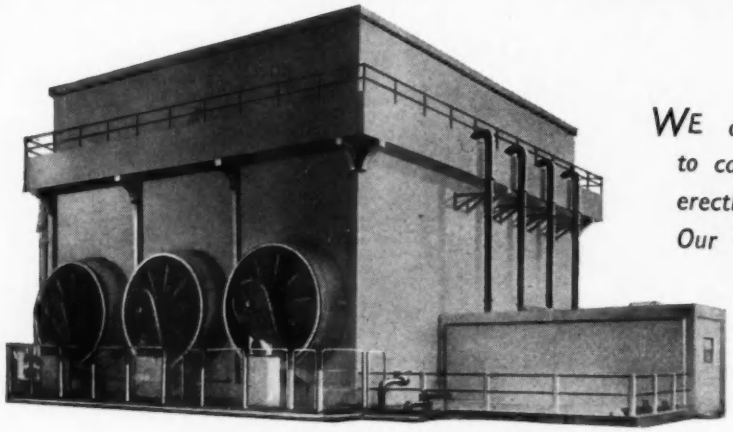


16/60 TRENCHER

JOHN ALLEN & SONS (OXFORD) LTD. COWLEY OXFORD Tel 77155/6/7

THE TORCH OF INDUSTRY
FAST COPPER PIPE FABRICATION WITH BRONZE WELDING
Bronze welding is a fast and efficient method of fabricating copper and steel pipes. British Oxygen bronze welding rods, fluxes and welding equipment give the best results for this work, whether used for prefabrication or on-site welding. When British Oxygen equipment is used the work is done quickly and the joints are uniformly sound and efficient. Here copper sanitary units for multi-storey work are being prefabricated with British Oxygen equipment, thus speeding up installation and saving valuable time on the site.
BOC
BRITISH OXYGEN

SPECIALIZED COOLING . . . . FORCED DRAUGHT



WE are fully equipped to carry out promptly the erection of Cooling Towers. Our Representative will call upon you at any time.

INQUIRIES INVITED.

Cascade WATER Coolers LTD.

BREWERY LANE, DEWSBURY . . . Phone: Dewsbury 1735

It's an awkward position but an EASY FIXING

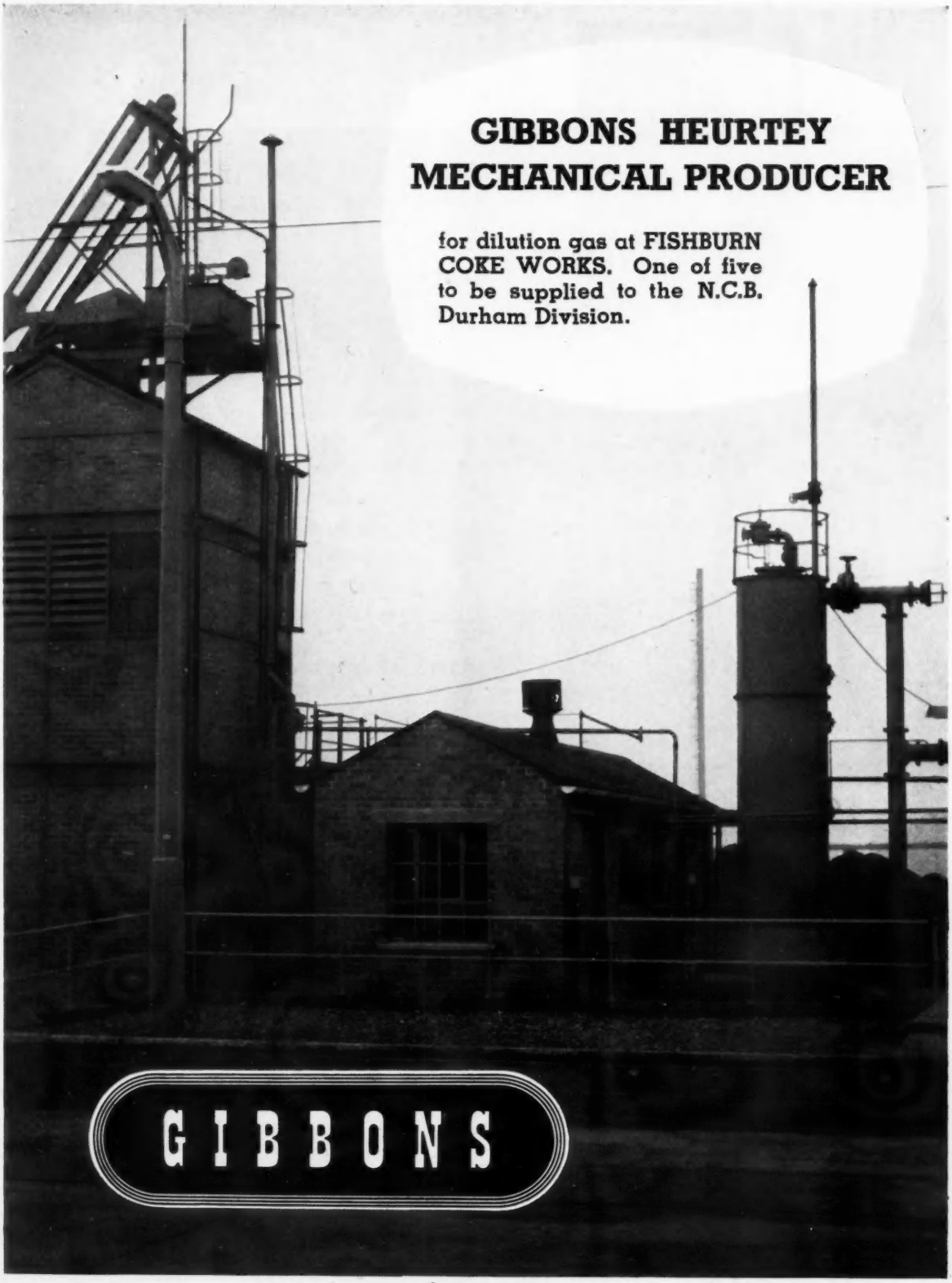
Here, as in every fixing job, there's only one way to ease, speed and efficiency—Rawlplug Fixing Devices and Tools.
Did you know that there is a Rawlplug for every size screw right up to ¾" diam. Coach Screws? Rawlbolts too run from $\frac{3}{16}$" to 1" diam., ample strength for really heavy bolt fixings, and *no waiting for cement to dry!* For speedy hole-boring use Rawlplug Tools—Durium-tipped masonry Drills, Kango hammers, Pneumatic Hammer Tools and many others. They all save time, make the job easier—and save money.
Write our Technical Dept. for free advice on your *fixing problem*

THE RAWLPLUG COMPANY LTD. RAWLPLUGS CROMWELL ROAD LONDON, S. W. 7

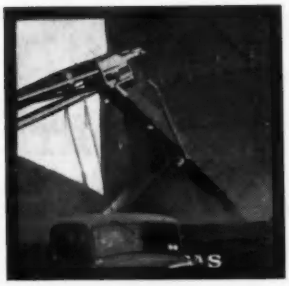
THE WORLD-WIDE FIXING DEVICES ORGANISATION

8487

Rawlplugs, Rawltools, Rawlbolts, Rawltamps, Rawlnuts, Bolt Anchors, Screw Anchors, White Bronze Plugs, Rawltoggles, Rawlclips, Cement in Sockets, Durium Drills and Hole Boring Tools for Hand, Electric Hammer or Pneumatic Hammer operation.


GIBBONS HEURTEY
MECHANICAL PRODUCER
for dilution gas at FISHBURN COKE WORKS. One of five to be supplied to the N.C.B. Durham Division.
GIBBONS

GIBBONS HEURTEY LIMITED, DIBDALE, DUDLEY, WORCS. TEL.: DUDLEY 3141



LOADING AND DE-BREEZING COKE IN ONE OPERATION

This continuous, two-in-one operation, recently carried out under test at a gas works, strikingly demonstrates the labour- and cost-cutting efficiency of our 30-ft. Super Mobile Stacker.

The stacker was fitted with our special Screen Attachment and fed by a single mobile shovel. In one hour, it handled 23 tons of old coke stock. The $1\frac{1}{2}''$ clear mesh screen extracted 6 tons of minus-$1\frac{1}{2}''$ coke, leaving 17 tons of well cleaned coke for dispatch to users.

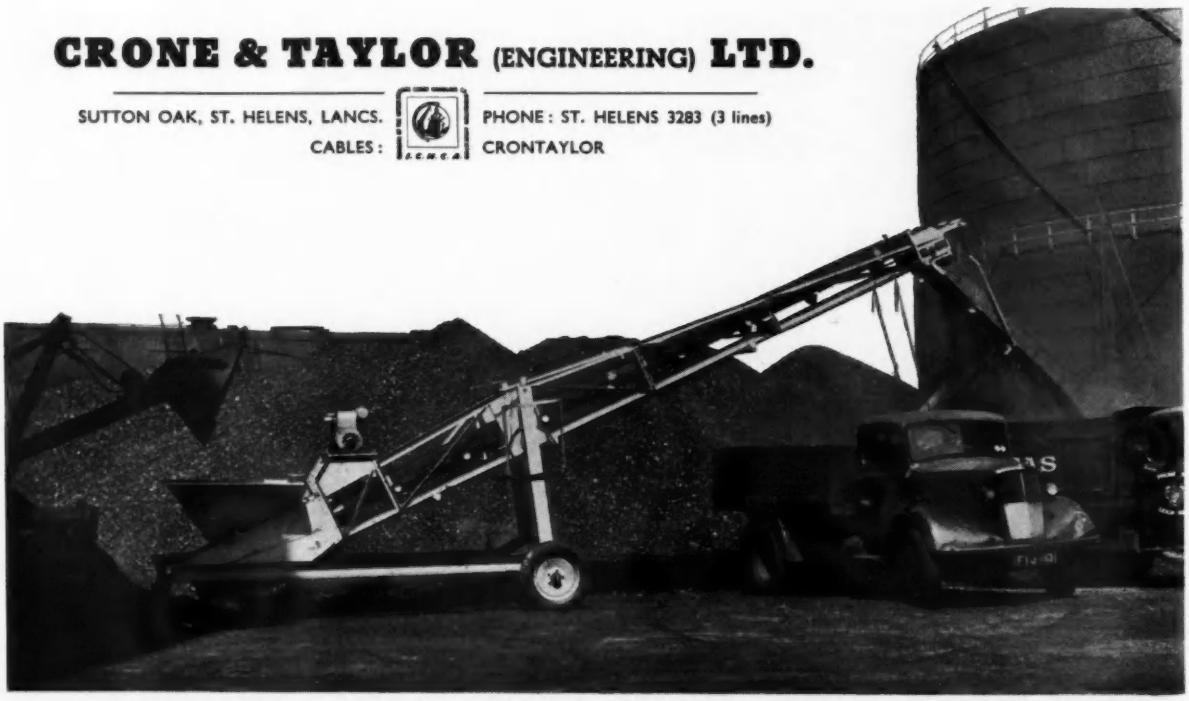
The Super Mobile Stacker can be towed anywhere by a mobile shovel, and it takes only a few minutes to change any screen from $\frac{3}{8}''$ to $1\frac{1}{2}''$. A single operator is all that is required for the complete process.

Write for details of the C. & T. SUPER MOBILE STACKER to:

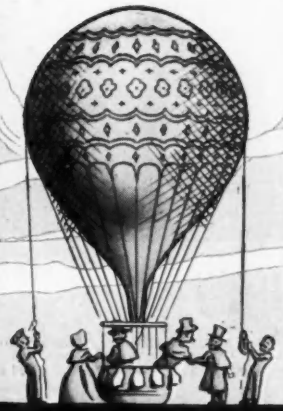
CRONE & TAYLOR (ENGINEERING) LTD.

SUTTON OAK, ST. HELENS, LANCS.
CABLES: CRONTAYLOR

PHONE: ST. HELENS 3283 (3 lines)



WE ALL DEPEND ON GAS



This coin plate has a setting range of 12 to 312 cu. ft. per shilling. A distinct advantage is the use of a single slot, through which both 6d. or 1/- coins, or both, can be taken by a simple adjustment of a clearly marked bracket located at the rear of the coin plate. The facilities for optional setting are clearly marked and the satin chrome and black finish on the embossed index plate is both attractive and durable. An ingenious cam action on the coin plate tends to draw the coins into the pocket.

George Wilson Gas Meters Ltd.,

COVENTRY · JARROW · LONDON · MANCHESTER · WOLVERHAMPTON · GLASGOW

E. C. & J. KEAY, LIMITED

CONSTRUCTIONAL ENGINEERS AND IRONFOUNDERS

Head Office:
"Runnymede,"
Stratford Road,
Henley-in-Arden,
Warwickshire

Also Offices
at
LONDON
SOUTHAMPTON

Cast Iron Purifiers temporarily erected in our Works prior to despatch

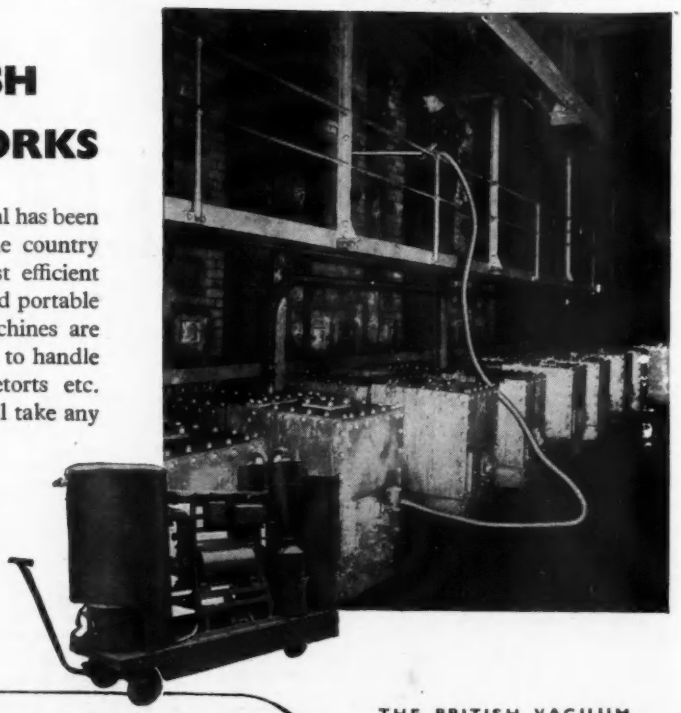
Specialists in Tanks, Steel or Cast-Iron, Riveted or Welded, etc.

JAMES BRIDGE WORKS, DARLASTON

HOT DUST AND ASH REMOVAL IN GAS WORKS

THE B.V.C. system of vacuum dust removal has been established in gas works throughout the country and is now generally recognised as the most efficient system for the purpose; both central plants and portable machines are available. Where portable machines are used a water cooler container allows the plant to handle the hot dust and ash from the top of retorts etc. and specially designed non-choking tools will take any volume of dust.

The illustration shows Redditch Gas works where a portable B.V.C. machine operates through an installed pipe system. Full particulars of these and other installations on request.



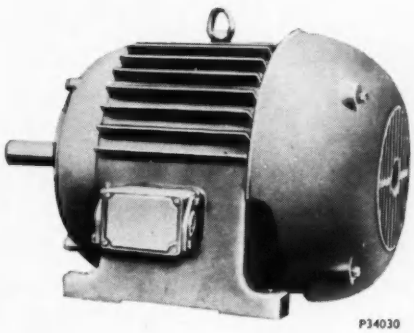
B.V.C
"BRITISH VACUUM CLEANER"
INDUSTRIAL VACUUM CLEANERS

THE BRITISH VACUUM CLEANER & ENGINEERING CO. LTD.
Dept. 42/BH Goblin Works, Leatherhead, Surrey
Tel.: ASHtead 866

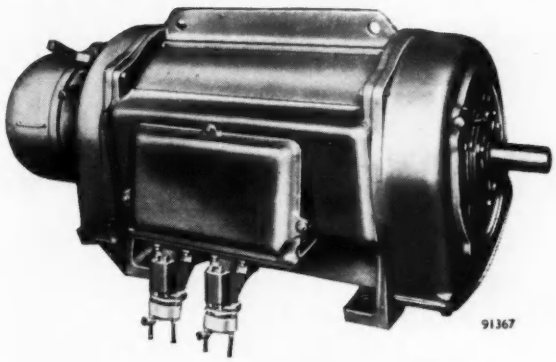
DOESN'T IT STAND TO REASON?

In specifying Metrovick motors you obtain more than compliance with B.S. requirements. Consider the company's research, design and production resources. Add to these the practical advice and service of engineers who really understand the problems of gasworks drives. You then have some of the very good reasons why more and more gasworks are turning to Metrovick motors.

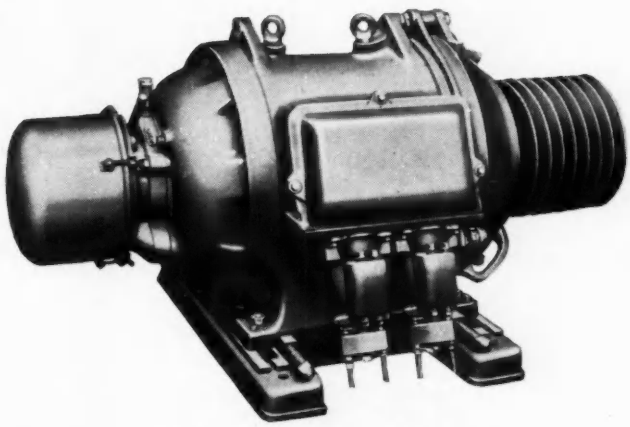
Flameproof motors are also available when required.



Metrovick type KZ squirrel cage totally enclosed fan cooled motors are available up to 40 hp.



100 h.p. and above type HRW high speed (2,960 rpm) drip-proof slipring motor.



100 h.p. and above type RW totally enclosed fan cooled slipring motor.

METROPOLITAN-VICKERS
ELECTRICAL CO LTD · TRAFFORD PARK · MANCHESTER 17

J/A303

Member of the A.E.I. group of companies

FSM

auto-matic burner ignition

for Gas or Oil

Practically all lighting-up procedures can now be carried out automatically and safely by one of the Elcontrol F.S.M. units.

Based on the monitoring of the pilot and/or main flame by an Infra-Red sensitive cell, the F.S.M. automatic Controllers give push-button starting, timed pre-ignition purging, timed ignition, lock out on failure to light-up, and running flame failure protection.

Units are available for a very wide variety of burner set-ups and our Advisory Service is at your disposal.

TRADE E MARK

ELCONTROL LTD

10 Wyndham Place, London, W.1. AMBassador 2671

Timers . Level Controls · Furnace Safeguards · Photo Switches

OUTMODED DE-GREASING METHODS EXPLODED with Jizer SOLUBLE SOLVENT

NON TOXIC

CAN BE USED COLD

NON ALKALINE AND HARMLESS TO HANDS

REMOVES LIGHT AND HEAVY DEPOSITS OF OIL AND GREASE

GIVES 50% GREATER GREASE ABSORPTION

Consider the advantages and test our claims by ordering 5 galls. of Jizer Soluble Solvent price 30/10d from Motor Factors Engineers and Factory Furnishers Etc. including all Branches of Brown Brothers Limited and Thomson and Brown Brothers Limited.

REMEMBER POPPY DAY

To DEB CHEMICAL PROPRIETARIES LTD. (G.J.)
Belper, Derbyshire.

Please send sample of JIZER SOLUBLE SOLVENT and details to

Firm's Name.....

Address.....

.....

Purifiers

OVERHEAD 4 TIER CAST-IRON PURIFIERS RECENTLY COMPLETED FOR GREAT HARWOOD (ACCRINGTON) GASWORKS

Photograph by Courtesy N.W.G.B.

FIVE BOXES EACH 30′-0″×35′-0″×10′-0″ DEEP

MAY WE HAVE YOUR ENQUIRIES FOR COMPLETE PURIFIER INSTALLATIONS

KIRKHAM, HULETT & CHANDLER LIMITED.

UNION FOUNDRY TELEPHONE: MANSFIELD 1256/7 MANSFIELD.

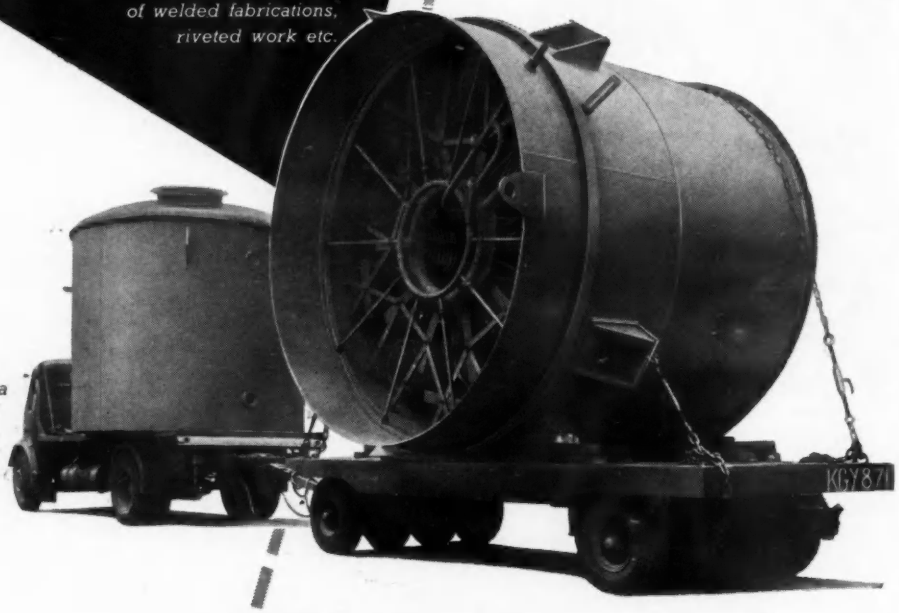
London Office:—STAFFORD HOUSE, NORFOLK STREET, STRAND, W.C.2.

Telephone: TEMple Bar 9910. *Telegrams:* Washer, Estrand, London.

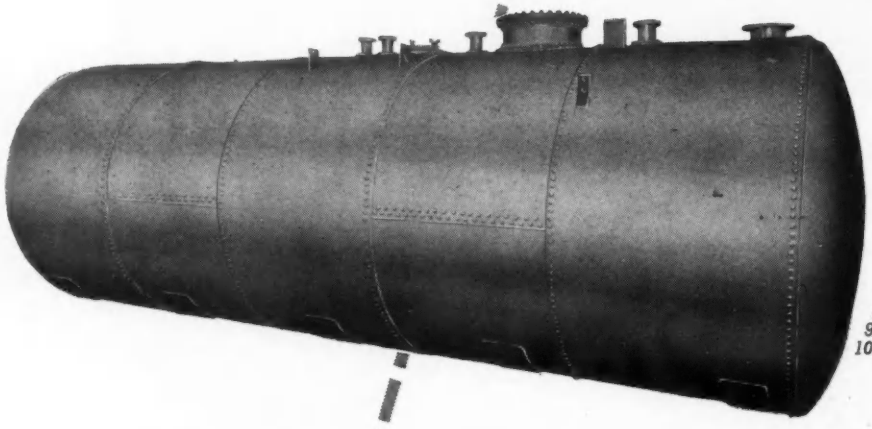
ENGINEERS TO THE CHEMICAL AND ALLIED INDUSTRIES

also specialists in the production of welded fabrications, riveted work etc.

We undertake Design, Construction and Site Erection of Complete Plants or Single Units



The two sections of a Deodoriser leaving our Works. Thirteen of these units have been supplied, installed and site welded at a new Refinery.



Example of a Riveted Acid Storage Tank. 9' 0" dia. x 24' 0" long. 10,000 Galls. capacity.

We invite your enquiries for supplies involving the use of . . .

STORAGE TANKS PANS CONDENSERS WASHERS
PRESSURE VESSELS STILLS HEAT EXCHANGERS
GAS MAINS JACKETTED VESSELS COLUMNS
AUTOCLAVES PIPE & VALVE WORK MIXERS
SILOS KEIRS EXPANSION JOINTS

RILEYS OF BATLEY

A. J. RILEY & SON LIMITED

VICTORIA WORKS, BATLEY, YORKSHIRE. Telephone: BATLEY 657 (3 lines). Telegrams: BOILERS BATLEY

"WEER BEVRIJD!" CRIED THE DUTCH

(LIBERATED AGAIN!)

36 MILES OF GAS & WATER MAINS FREED FROM SCALE

Enthusiastic Officials in Holland Acclaim General Descaling's latest success

Enschede, Holland. Wednesday. The town of Enschede in the East of Holland is back to normal again. Gas and Water Mains are once more operating to full capacity. The dangerous concentrations of scale which threatened to blockade these vital services have been speedily exterminated in a brilliant series of cleaning-up operations conducted by General Descaling—veteran victor of Scale Wars.

Commanding highly trained forces and using the latest equipment, General Descaling made a number of attacks on scale strong points throughout the town. These engagements were carefully planned and swiftly executed—with a minimum of disruption to services.

Latest despatches confirm that over 36 miles of cast-iron gas and water mains (some 12 in. in diameter) were successfully descaled in this campaign.

" Liberated again " cried enthusiastic officials when normal services were resumed.

GENERAL DESCALING M.C.E. exhibits patented Scale Removers used during campaign in Holland.*
*(*Mechanical and Chemical Engineer)*

Street scene at Enschede showing boring machine in action which can descale up to 350 yds. from one surface cut, at 50 yds. per hour.

GENERAL DESCALING SHOWS HOW IT'S DONE

"Just another routine operation" commented General Descaling at his H.Q. yesterday. "Scale hasn't a chance when you call us in. With our weapons and tactics, we can rout out the most strongly entrenched deposits from Gas and Water Mains, Sewers and Culverts, at a fraction of the time and cost it would take to re-lay them. We operate safely, quickly and with a minimum of cutting and disturbance of services—leaving a finish as good as new.

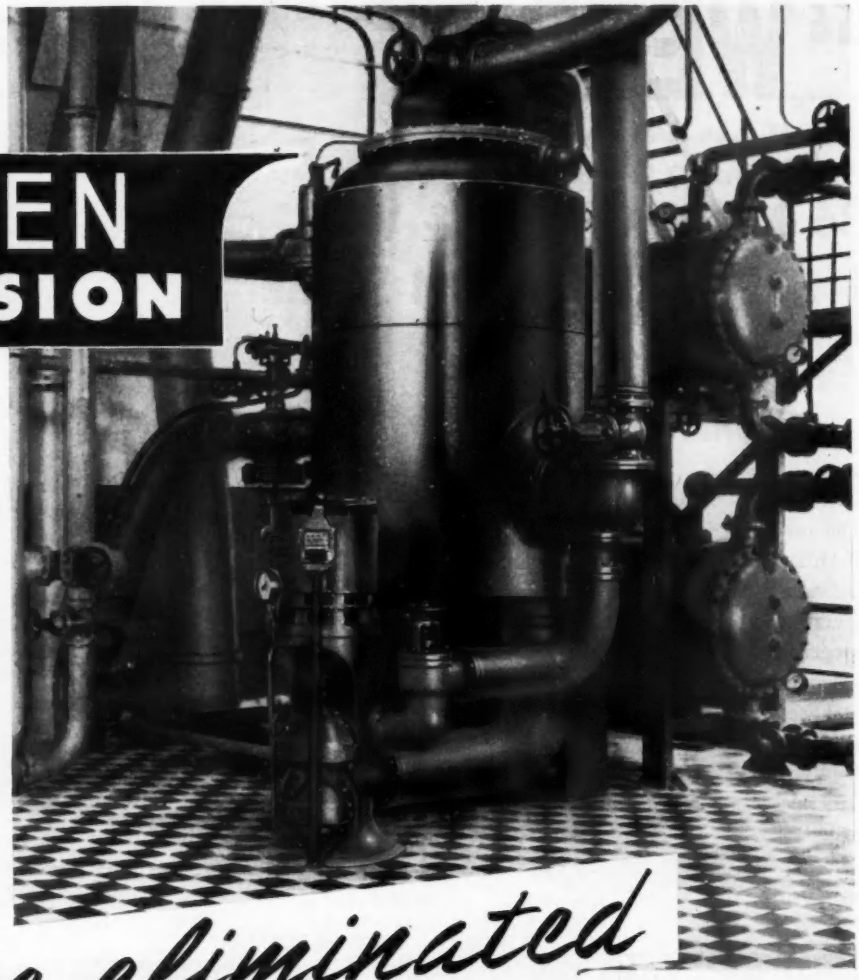
WARFARE ON A GLOBAL 'SCALE'

Meanwhile other units of General Descaling's forces are actively engaged throughout the world, wherever scale is to be found—in cast-iron, steel and earthenware pipes from 1½" to 36" in diameter. Anti-Scale assault troops are always ready to tackle YOUR scale problems at a moment's notice. If you need their assistance 'phone or write to-day. If you require further information it will be sent immediately.

General Descaling Co. Ltd., H.Q. Worksop, Notts., *Tel.*: 3211-3.

B

OXYGEN CORROSION



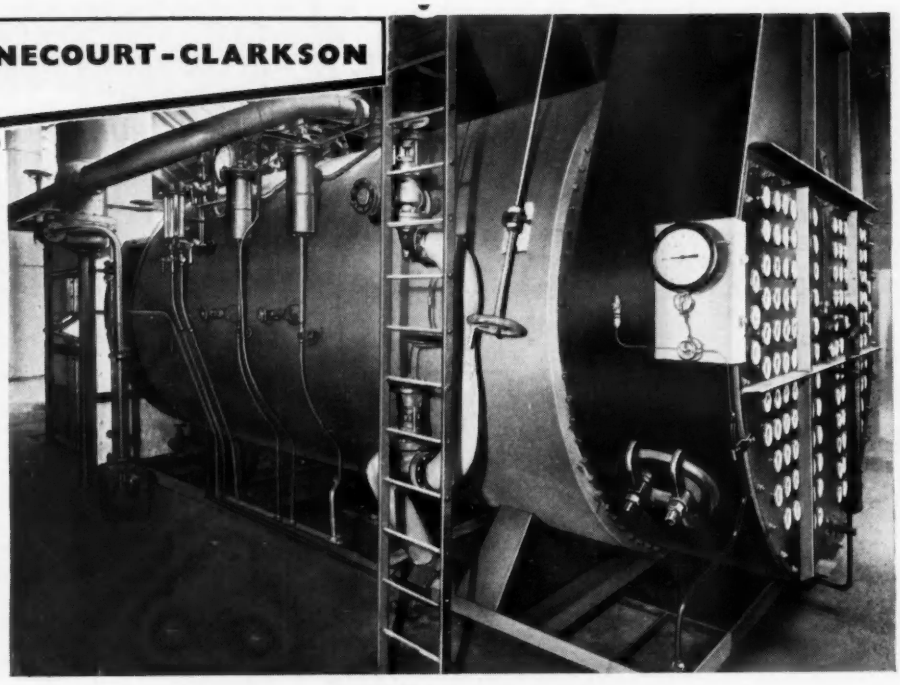
can be eliminated

WITH THE WEIR "OPTIMUM" DE-AERATOR which is the simplest and most effective equipment for removing corrosive gases dissolved in boiler feed water, and so protecting boiler surfaces, piping, economisers, etc., from corrosion and pitting. The Weir De-aerator can readily be installed in existing power plants, and heat in the operating steam is retained in the feed water. Write for Publication No. GK.37 "Eliminate Corrosion in the Power Plant."

MAKERS OF BOILER FEED PUMPS AND AUXILIARIES

G. & J. WEIR LTD. CATHCART : GLASGOW

SPENCER-BONECOURT-CLARKSON
LIMITED

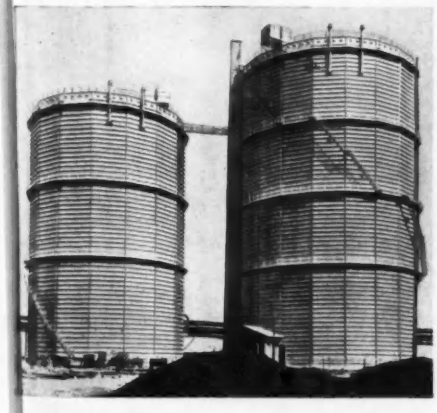


SPECIALISTS IN WASTE HEAT RECOVERY PLANT

The illustration shows one of the Spencer-Bonecourt waste-heat boilers at Stoke-on-Trent Gas Works. Similar units are installed on all the Glover-West Continuous Vertical carbonising plant in this works.

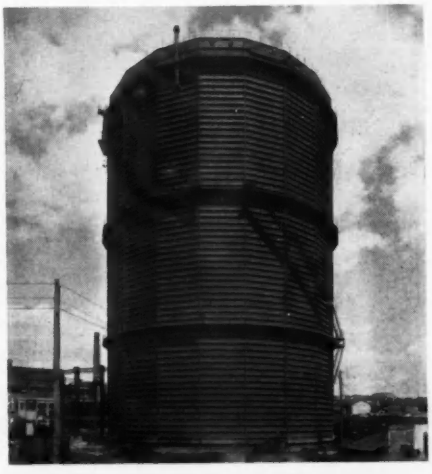
14-15 FETTER LANE, LONDON, E.C.4.

Telephone : FLEet Street 0481 and 6181
Telegrams : HEATECON, PHONE, LONDON



South Africa

Overseas Contracts



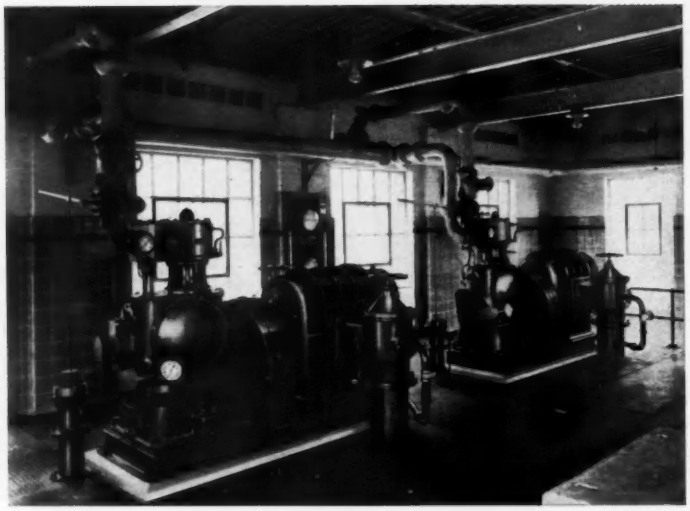
M.A.N.
WATERLESS GASHOLDERS
RECENTLY ERECTED → Spain

CLAYTON SON & CO. LTD.
HUNSLET, LEEDS.

SISSON STEAM ENGINES

FOR LONG PERIOD CONTINUOUS RUNNING

DESIGNED for driving EXHAUSTERS BOOSTERS COMPRESSORS ETC.



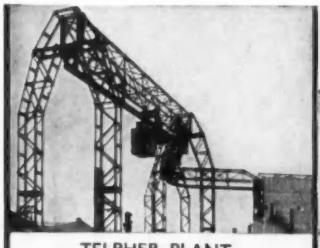
COMPACT STURDY and RELIABLE

SUITABLE for GAS GOVERNOR or AUTOMATIC CONTROL

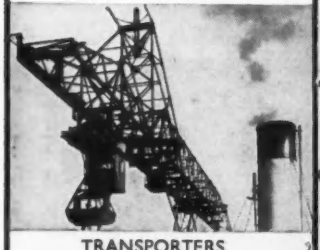
Telegrams: SISSON

W. SISSON & CO., LTD.
GLOUCESTER, ENGLAND.

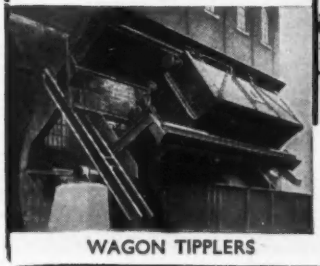
Telephone: 22295-6



TELPHER PLANT

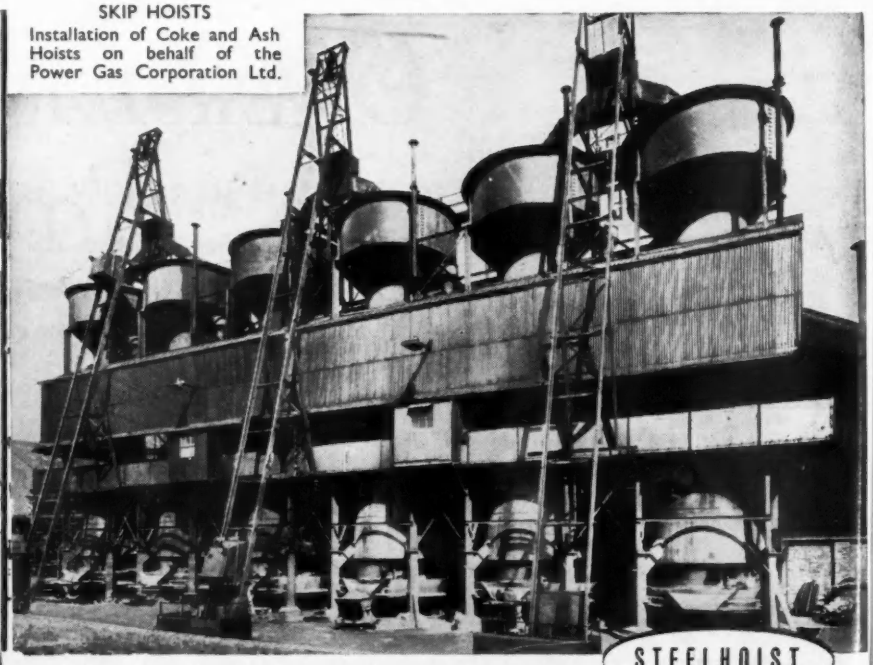


TRANSPORTERS



WAGON TIPPLERS

SKIP HOISTS
Installation of Coke and Ash Hoists on behalf of the Power Gas Corporation Ltd.



STEELHOIST

Plant for the movement of material in bulk

STRACHAN & HENSHAW LTD

Steelhoist Works. Bristol 2. Tel: 78331.

Plants are now at work or being installed at

	Total capacity cu. ft. day
1 Unit SYDENHAM	800,000
1 Unit YORK	800,000
1 Unit HAMELN (Germany)*	800,000
1 Unit PONDERS END*	3,200,000
2 Units UXBRIDGE*	3,200,000
	8,800,000

*Under construction

LICENSEES

PGC

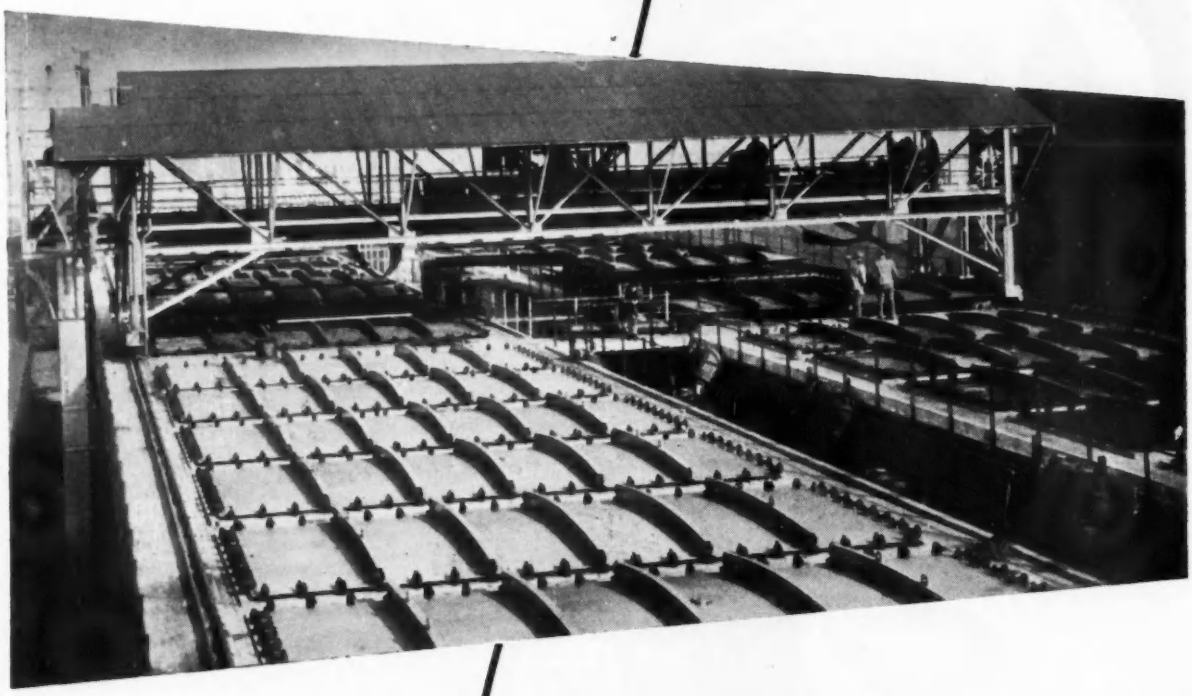
THE POWER-GAS CORPORATION LTD
(PARENT COMPANY OF THE POWER-GAS GROUP)
STOCKTON-ON-TEES AND LONDON
AUSTRALIA · CANADA · INDIA · FRANCE · SOUTH AFRICA

226

SUB-LICENSEES

COMPRIMO N.V. Amsterdam · DIDIER-KOGAG-HINSELMANN G.m.b.H. Essen
SOC. per AZ. FORNI ed IMPIANTI INDUSTRIALI INGG de BARTOLOMEIS Milan

OXIDE HANDLING



THE MODERN WAY

SPECIAL FEATURES OF THIS PLANT:

ELEVATOR IN ALUMINIUM

GRAVITY-WEIGHTED CABLE REELING DRUM

ABRASIVE RUBBER COVERED BELT IDLERS

COVER OVER LOADING OPERATIONS

ANTI-CORROSIVE TREATMENT OF STRUCTURE

MECHANICAL HANDLING PLANT FOR THE COKE AND GAS INDUSTRIES

HUWOOD

Head Office and Factories:

HUGH WOOD & CO., LTD. :: GATESHEAD-ON-TYNE, 11.

Telegrams: HUWOOD, GATESHEAD. Telephone: LOW FELL 76083 (5 lines).

Industrial and Export Office:

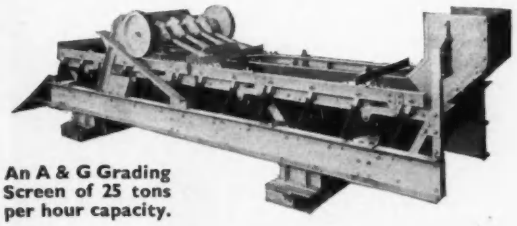
DASHWOOD HOUSE, 69, OLD BROAD STREET, LONDON, E.C. 2.

Telegrams: HUWOOD AVE., LONDON. Telephone: LONdon WALL 6631-2-3

IND/FB/63

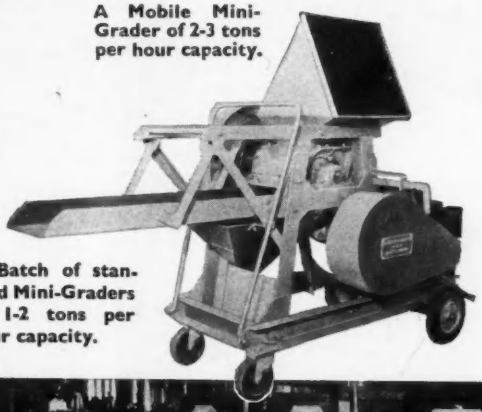
SCREENS

Made in the "Mini-Grader" Range up to 5 tons per hour and in the A & G and Standard range up to 50 tons per hour capacities.

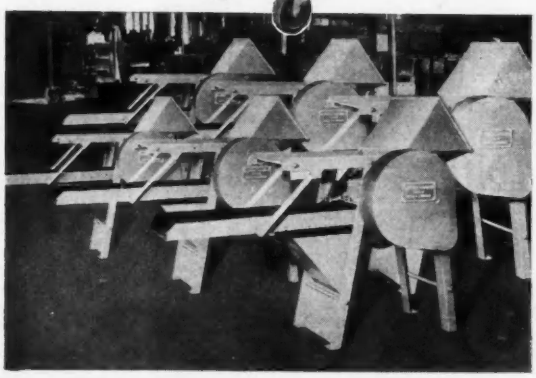


An A & G Grading Screen of 25 tons per hour capacity.

A Mobile Mini-Grader of 2-3 tons per hour capacity.



A Batch of standard Mini-Graders of 1-2 tons per hour capacity.



ALDRIDGE & RANKEN LIMITED
AVONBANK WORKS, BATH
Tel.: 2936 & 5711

the last word in gas installations

FROM STOCK
10" & 12" New Cast Iron Flanged Pipes 9' & 12'
4" Reconditioned Cast Iron Flanged Pipes 9'.

VALVES for GAS, WATER, & STEAM
Sizes ¼" to 36" in C.I. Gun Metal & Steel.

STEEL TUBES
All sizes up to 24" Flanged, Plain ends, Screwed & Socketed, Loose Flanged, Victaulic & Unicone Joints.

MIDLAND IRON & HARDWARE CO. (Cradley Heath) LTD.
CRADLEY HEATH, STAFFS
Telegrams: PIPES, CRADLEY HEATH *'Phone:* CRADLEY HEATH 6264-5-6

HAWKINS
IMPERISHABLE
JOINTING PASTE
ONE OF THE FIRST AND STILL THE BEST
W. T. HAWKINS & CO.
CHAPEL HILL, HUDDERSFIELD.

PROTECT *your plant from the action of acid fumes and corrosive gases*

***-use* 'SUPRUBA'**
Chlorinated Rubber Paint
—the material that has been proved in actual use!

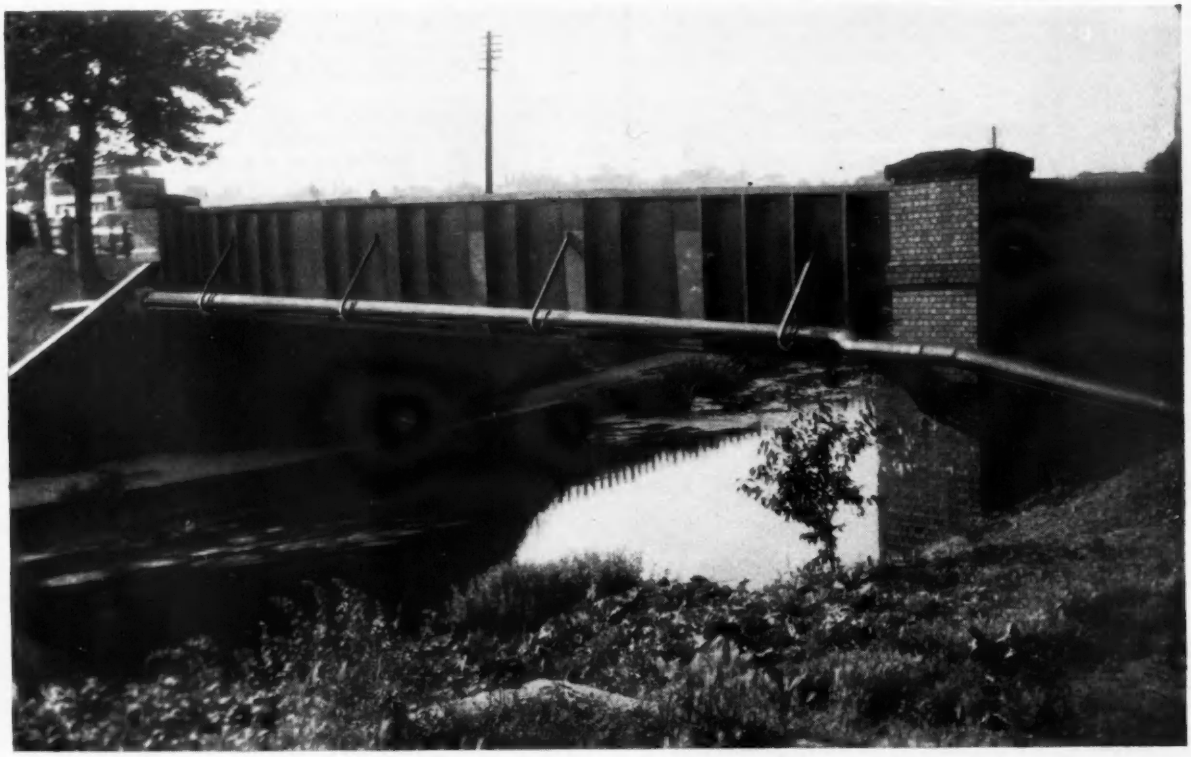
SUPPLIED IN A RANGE OF COLOURS

Write for full details from
LUNT BROTHERS LTD.
Head Office 23, Colmore Row, Birmingham 3. CENtral 7408
Colliery Offices Stourbridge, Worcs. Stourbridge 5201
or from the Manufacturers
SUPRA CHEMICALS AND PAINTS LTD.
Hainge Road, Tividale, Tipton, Staffs. TIPton 2511/2

ANOTHER SUPRA REGD. TRADE MARK *PRODUCT*

L.G.B.

"WELL AND
TRULY LAID"



MAINLAYING

Over 30 years' sound experience.

Skilled and gas-minded workmen.

Thousands of miles of mains have been laid by JEAVONS.

E · E · JEAVONS & CO · LTD

TIPTON · · · · STAFFS.

'Phone: TIPTON 2161 (6 LINES) 'Grams: "PIPELINES" TIPTON

INDEX TO 'JOURNAL' ADVERTISERS

A

A.C.E. Machinery, Ltd. ... ... PAGE
Abbott, Birks & Co., Ltd. ... ...
Acme Wringers, Ltd. ... ...
Aerogen Co., Ltd. ... ...
Aerograph Co., Ltd. ... ...
Aironic Ltd. ... ...
Alder & Mackay, Ltd. ... ...
Aldridge & Ranken, Ltd. 373
Allan Taylor (Engineers), Ltd. ... ...
Allen, John, & Son (Oxford), Ltd. 356
Allied Ironfounders Ltd. ... ...
Amal, Ltd. ... ...
Ascot Gas Water Heaters, Ltd. ... ...
Ascot Gas Water Heaters, Ltd. (F. A. Neat) ...
Ashmore, Benson, Pease & Co. 371
Ashworth & Parker, Ltd. ... ...
Asphalt's (Paints), Ltd. ... ...
Associated Lead Manufacturers, Ltd. ... ...
Associated Lead Manufacturers, Ltd. (Rustodian) ...
Atlas Preservative Co., Ltd. ... ...
Audley Engineering Co., Ltd. ... ...
Automatic Telephone & Electric Co., Ltd. ...
Automotive Products, Ltd. ... ...

B

Bale & Church, Ltd. 407
Balfour, Henry, & Co., Ltd. ... ...
Bayley, Thos., (Great Bridge), Ltd. 406
Begwaco Meters, Ltd. ... ...
Benham & Sons, Ltd. ... ...
Birtley Co., Ltd. ... ...
Blakeley Firth, Sons & Co., Ltd. ... ...
Booth, John, & Sons (Bolton), Ltd. ... ...
Bratt Colbran, Ltd. ... ...
Bray, George, & Co., Ltd. 352
Bray, W. E., & Co., Ltd. ... ...
British Carbo-Norit Union, Ltd. ... ...
British Gas Purifying Materials Co. ... ...
British Jeffrey-Diamond, Ltd. ... ...
British Oxygen Co., Ltd. 357
British Paints, Ltd. ... ...
British Rototherm Co., Ltd. ... ...
British Thermostat Co., Ltd. 402
British Thomson Houston, Ltd. ... ...
British Tyre & Rubber Co., Ltd. ... ...
British Vacuum Cleaner & Engineering Co., Ltd. 362
Broadbent, Thomas, & Sons, Ltd. ... ...
Broom & Wade, Ltd. ... ...
Brown, J., & Co., Ltd. 406
Bugden, Thos., & Co. ... ...

C

Cambridge Instrument Co., Ltd. ... ...
Cannon (G. A.), Ltd. ... ...
Cascade Water Coolers, Ltd. 358
Cathodic Corrosion Control, Ltd. ... ...
Cementation Co., Ltd. ... ...
Cinema-Television, Ltd. ... ...
Clapham Bros., Ltd. ... ...
Clayton, Son & Co., Ltd. 369
Clifford Engineering Co., Ltd. ... ...
Cochrane (Middlesbro') Foundry, Ltd. ... ...
Cohen, George, Sons & Co., Ltd. 353
Concrete Proofing Co., Ltd. ... ...
Consolidated Pneumatic Tool Co., Ltd. ... ...
Consett Iron Co., Ltd. ... ...
Cort, Robert, & Son, Ltd. ... ...
Crane, Ltd. ... ...
Crone & Taylor, Ltd. 360
Crosby & Co., Ltd. ... ...
Crossley Bros. ... ...
Crowley Russell & Co., Ltd. ... ...
Curtis, A. L., & Co. ... ...
Cutler, Samuel, & Sons, Ltd. 402
Cuxson, Gerrard & Co., Ltd. ... ...

D

Davenport Engineering Co., Ltd. ... ...
Davey, Paxman & Co., Ltd. 356
Deb Chemical Proprietaries, Ltd. 364
De la Rue, Thomas, & Co., Ltd. (Gas Group) Cover I
Dempster, R. & J., Ltd. 351
Dempster, Robert, & Sons, Ltd. 393
Denison & Son, Ltd. ... ...
Derbyshire Silica Firebrick Co., Ltd. ... ...
Diaphragm & General Leather Co., Ltd. ... ...
Dick, R. & J., Ltd. ... ...
Donkin (The Bryan) Co., Ltd. ... ... Cover II
Douglas, Wm., & Sons, Ltd. ... ...
Drakes, Ltd. ... ...
Dresser Manufactures (England), Ltd. ... ...
Drew, H. B., Ltd. ... ...
Drummond Patents, Ltd. ... ...

E

E.B. Refractory Cement Co., Ltd. ... ...
Edgar, William, & Son, Ltd. ... ...
Econtrol, Ltd. 364
Electrofio Meters Co., Ltd. ... ...
Electrolux, Ltd. ... ...
Elliott Bros. (London), Ltd. ... ...
Erskine, Heap & Co., Ltd. ... ...
Essard, Ltd. ... ...
Essex Partners, Ltd. ... ...
Ether, Ltd. ... ...
Evered & Co., Ltd. ... ...
Ewart & Sons, Ltd. ... ...
Ewart Chainbelt Co., Ltd. ... ...

F

Fisher Governor Co., Ltd. ... ...
Fitzel, S., & Co., Ltd. 396
Fluidrive Engineering Co., Ltd. ... ...
Fowler, John, & Co. (Leeds), Ltd. ... ...

Franki Compressed Pile Co., Ltd. ... ... PAGE
Franklin Furnace Co., Ltd. ... ...
Fry's Metal Foundries, Ltd' ... ...

G

Gas Purification, Ltd. 407
General Descaling Co., Ltd. 367
General Electric Co., Ltd. ... ...
General Gas Appliances, Ltd. 401
Gibbons Bros., Ltd. 359
Gibbons Heurtey, Ltd. 359
Glover, George, & Co., Ltd. ... ...
Glover, Thomas, & Co., Ltd. 378
Godfrey, Sir George, & Partners (Industrial), Ltd. ...
Goodall Clayton & Co., Ltd. 406
Goodyear Mechanical Goods ... ...
Grant, Lyon, & Co., Ltd. ... ...
Graphite Products, Ltd. ... ...
Green & Boulding, Ltd. 407

H

Hamilton, A. H., & Co., Ltd. ... ...
Hardman & Holden, Ltd. ... ...
Harris & Pearson, Ltd. 406
Harrisons (London), Ltd. 408
Hattersley & Davidson ... ...
Hawkins, W. T., & Co. 373
Hayward, E., & Co., Ltd. ... ...
Hick Hargreaves & Co., Ltd. ... ...
Hilmor, Ltd. ... ...
Hills (West Bromwich), Ltd. ... ...
Holmes, W. C., & Co., Ltd. 409
Honeywell Brown, Ltd. ... ...
Hopkinsons, Ltd. ... ...
Horseley Bridge & Thomas Piggott, Ltd. ...
Horstmann Gear Co., Ltd. ... ...
Howden, James, & Co., Ltd. ... ...
Hudswell, Clark & Co., Ltd. ... ...
Humphreys & Glasgow, Ltd. 376
Hyde, Silas, Ltd. ... ...

I

Ideal Boilers & Radiators, Ltd. ... ...
I.C.I., Ltd. (Fyffes Fittings) ... ...
I.C.I., Ltd. (Metals Division) ... ...
Inertol, Ltd. ... ...
Infra Red Development Co., Ltd. ... ...
Ingham, John, & Sons, Ltd. ... ...

J

Jeavons, E. E., & Co., Ltd. 374
Jeavons Engineering Co. ... ...
Jenkins, W. J., & Co., Ltd. ... ...
Johnson, C. H., (Machinery), Ltd. ... ...

K

Keay, E. C. & J., Ltd. 362
Keelavite Rotary Pumps & Motors, Ltd. ... ...
Keith Blackman, Ltd. 410
Kings Patent Agency, Ltd. 407
King, Walter, Ltd. 406, 407, 408
Kirk & Co. (Tubes), Ltd. ... ...
Kirkham Hulett & Chandler, Ltd. 365

L

Lafarge Aluminous Cement Co., Ltd. ... ...
Laidlaw, R., & Son (Edin.), Ltd. ... ...
Lamont, James H., & Co., Ltd. ... ...
Le Bas Tube Co., Ltd. ... ...
Leeds Fireclay Co., Ltd. ... ...
Lee, Howl & Co., Ltd. ... ...
Lindsay, Henry, Ltd. ... ...
Lionweld, Ltd. ... ...
Lind, Peter, Ltd. ... ...

M

MacLellan, George & Co., Ltd. ... ...
Macpherson, Donald, & Co., Ltd. ... ...
Magnetic Valve Co., Ltd. ... ...
Main, R. & A., Ltd. ... ...
Mapel Metal & Pipeline Endurance, Ltd. ...
Matterson, Ltd. ... ...
Meltham Silica Fire Brick Co., Ltd. ... ...
Mercol Products, Ltd. ... ...
Messengers & Sons (Birmingham) Ltd. ... ...
Meters, Ltd. ... ...
Metropolitan Vickers Electrical Co., Ltd. ... 363
Midland Iron & Hardware Co. (Cradley Heath), Ltd. 373
Milnes Meters, Ltd. ... ...
Mint, Birmingham, Ltd. ... ...
Mitchell Engineering, Ltd. ... ...
Mitchell, H., & Co. ... ...
Monitor Engineering & Oil Appliances, Ltd. ...
Monk, A., & Co., Ltd. ... ...

N

National Benzole Co., Ltd. ... ...
National Cash Register Co., Ltd. ... ...
National Enamels, Ltd. ... ...
Newton Chambers & Co., Ltd. ... ... Cover IV
Norwest Construction Co., Ltd. ... ...
Nu-Swift, Ltd. ... ...

O

Oxley Engineering Co., Ltd. ... ...

P

Parkinson & Cowan (Gas Meters), Ltd. 378
Parkinson Stove Co., Ltd. ... ...
Pass, E., & Co., Ltd. ... ...
Peart, E., & Co., Ltd. ... ...
Peebles & Co., Ltd. ... ...
Perl Controls, Ltd. ... ...
Plenty & Son, Ltd. 352
Power-Gas Corporation, Ltd. 371
Press, William, & Son, Ltd. ... ...
Provincial Exhibitions, Ltd. ... ...
Pulsometer Engineering Co., Ltd. ... ...

R

Radiant Heating, Ltd. ... ... PAGE
Radiation, Ltd. 394, 395
Rawlplug Co., Ltd. 358
Reavell & Co., Ltd. 406
Ride & Bell, Ltd. ... ...
Riley, A. J., & Son, Ltd. 366
Roberts, R. E., & Sons, Ltd. ... ...
Robinson, J. H., & Co. (Liverpool), Ltd. ...
Royston, Geo., & Sons, Ltd. ... ...
Rozalex, Ltd. ... ...
Russell, R., & Sons, Ltd. ... ...

S

Salter, T. E., Ltd. ... ...
Senior Economisers, Ltd. ... ...
Siebe Gorman & Co., Ltd. ... ...
Sieber, Jas., Equipment Co., Ltd. 407
Siemens-Schuckert (Great Britain), Ltd. ...
Sigma Instrument Co., Ltd. ... ...
Silvertown Rubber Company Ltd. ... ...
Simon-Carves, Ltd. ... ...
Simon, Richard, & Sons, Ltd. ... ...
Sisson, W., & Co., Ltd. 370
Smith Meters, Ltd. ... ...
Smith, Thos., & Sons (Rodley), Ltd. ... ...
Spencer Bonecourt, Ltd. 369
Sperryn & Co., Ltd. ... ...
Stanton Ironworks Co., Ltd. ... .. facing p. 387
Staveley Iron & Chemical Co., Ltd. ... ...
Steels Engineering Installations, Ltd. 377
Stein, John G., & Co., Ltd. ... ...
Stelcon (Industrial Floors), Ltd. ... ...
Stewart & Gray, Ltd. ... ...
Stewarts & Lloyds, Ltd. ... ...
Stillite Products, Ltd. ... ...
Stothert & Pitt, Ltd. ... ...
Stoves, Ltd. ... ...
Strachan & Henshaw, Ltd. ... ... 37(
Stringer Bros. ... ...
Sugg, Wm., & Co., Ltd. ... ...
Supra Chemicals & Paints, Ltd. 373
Sutcliffe, R., Ltd. ... ...
Sutcliffe Speakman & Co., Ltd. ... ...
Sutherland, A. G., Ltd. ... ...

T

T & T Works, Ltd. ... ...
Tangyes, Ltd. ... ...
Thermal Syndicate, Ltd. ... ...
Thompson, Edward, Ltd. ... ...
Thorp, Thomas, & Co., Ltd. ... ...
Tully Engineering Co., Ltd. ... ...
Turners Asbestos Cement Co., Ltd. ... ...

U

Underpressure Engineering Co., Ltd. 406
United Kingdom Construction & Eng. Co., Ltd. ...
Unit Superheater & Pipe Co., Ltd ... ...

V

Vaughan, Edgar, & Co., Ltd. ... ...
Visco Engineering Co., Ltd. ... ...
Vulcan Stove Co., Ltd. ... ...

W

Wade Couplings, Ltd. ... ...
Wailes Dove Bitumastic Ltd. ... ...
Wakelin, F. H., Ltd. ... ...
Walker Bros., Ltd. ... ...
Walker, C. & W., Ltd. ... ...
Walker, Crosweller & Co., Ltd. ... ...
Walker, Wm., & Sons (Hanley), Ltd. ... ...
Waller, George, & Sons, Ltd. ... ...
Walter King, Ltd. 406, 407, 408
Ward, Thos. W., Ltd. ... ...
Watson, Robt., & Co. (Constructional Engineers), Ltd. ...
Weir, G. & J., Ltd. 368
Wellington Tube Works, Ltd. ... ...
Wellman Smith Owen Engineering Corpn., Ltd. ...
West's Gas Improvement Co., Ltd. ... Cover III
West's Piling & Construction Co. ... ...
Westwood & Wrights, Ltd. ... ...
Whessoe, Ltd. 355
Whitley Moran & Co., Ltd. ... ...
Whitlock Bros., Ltd. ... ...
Wilkes, A. H., & Co., Ltd. ... ...
Willey & Co., Ltd. 354
Williams, John E., Ltd. ... ...
Williamson, Cliff, Ltd. ... ...
Wilson, George, Gas Meters, Ltd. 361
Winn & Coales, Ltd. ... ...
Woodall-Duckham Construction Co., Ltd. facing p. 386
Wood, Hugh, & Co., Ltd. 372
Wormald Patent Locks Co., Ltd. ... ...

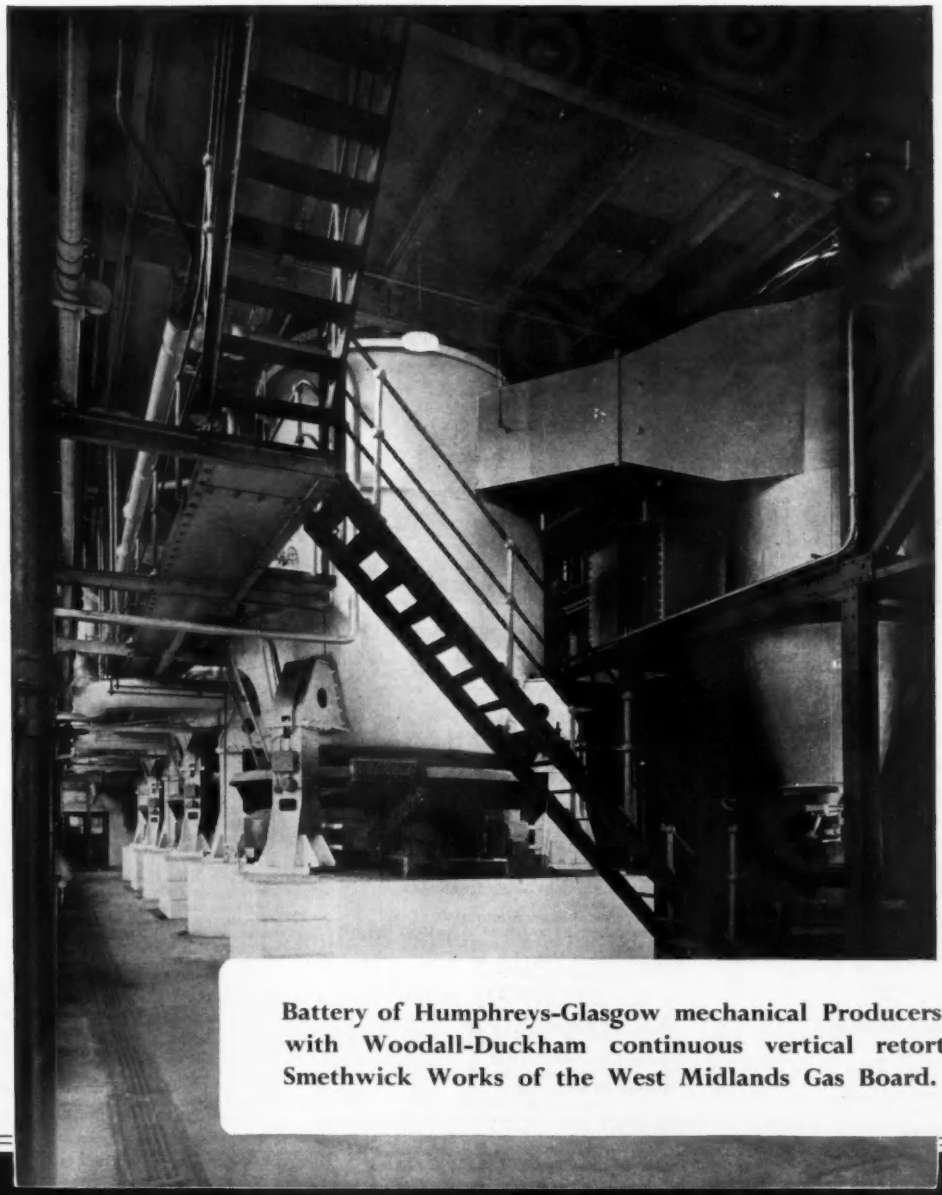
Y

Yorkshire Copper Works, Ltd. ... ...

Agencies ... ... PAGE
Appointments Vacant 407, 408
Appointments Wanted ... ...
Book Wanted ... ...
Contracts Open ... ...
Educational ... ...
Fellowship ... ...
Miscellaneous ... ...
Patents 407
Plant For Sale 408
Publications ... ...

H&G

Producer Gas Plant



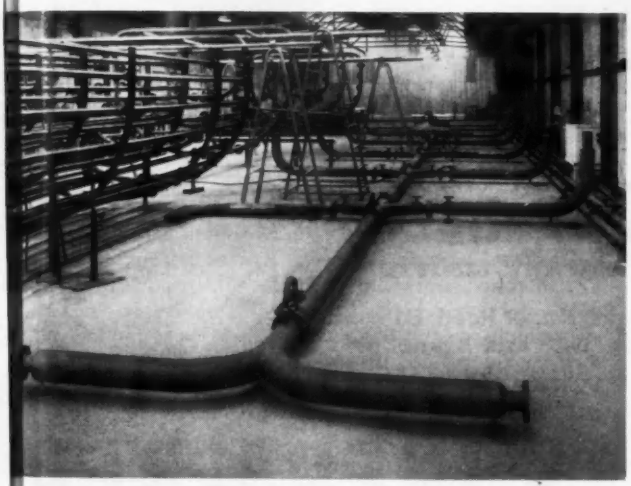
Battery of Humphreys-Glasgow mechanical Producers installed with Woodall-Duckham continuous vertical retorts at the Smethwick Works of the West Midlands Gas Board.

HUMPHREYS & GLASGOW LTD.

HUMGLAS HOUSE · CARLISLE PLACE · LONDON · S.W.1 Telephone VICtoria 3961

ESTABLISHED 1892

STEELS
Fabricated
PIPEWORK
for medium
& Low pressure work



All forms of tube in steel, copper, copper nickel, iron, stainless steel, and aluminium alloys. STEELS are already working for the biggest names in industry and under Lloyds supervision. A recent contract for Kuwait included pipe coils in Bitumen Storage Tanks, a jacketed Bitumen pipe line, steam supplies to coils and jacketed lines, condensate recovery, boiler house auxiliaries and boiler house pipework.

Send for more details to U.K. & OVERSEAS SALES OFFICE:

STEELS ENGINEERING INSTALLATIONS LTD
CROWN WORKS, SUNDERLAND
Supplied and installed in Scotland by:
ARCHIBALD LOW & SONS LTD
82 MERKLAND ST., PARTICK, GLASGOW, W.1
U.K. & OVERSEAS SALES OFFICE:
6 AVONMORE RD., KENSINGTON, LONDON, W.14
PHONE: FULHAM 7732 (5 LINES) GRAMS: STEELASCOS HAMMER LONDON

C 4637

Gas Journal

VOL. 284 NO. 4823 November 9, 1955
107TH YEAR

MANAGING DIRECTOR: Clifford A. King

EDITOR: Trevor G. Williams, A.M.I.Mech.E., Assoc.Inst.Gas E., M.Inst.F.

DEPUTY EDITOR: Arthur C. Cross

Published by Walter King Limited,
11, Bolt Court, Fleet St., London, E.C.4

Telephone: FLEet Street 2236-7 Telegrams: Gasking, Fleet

CONTENTS

EDITORIAL COMMENT

The Second Reading .. 379
West German Scientific Recovery .. 380
Fuel Campaign .. 380
Service for the Elderly .. 381
Cleaning-up Operation .. 381
Gas on the Farm .. 381

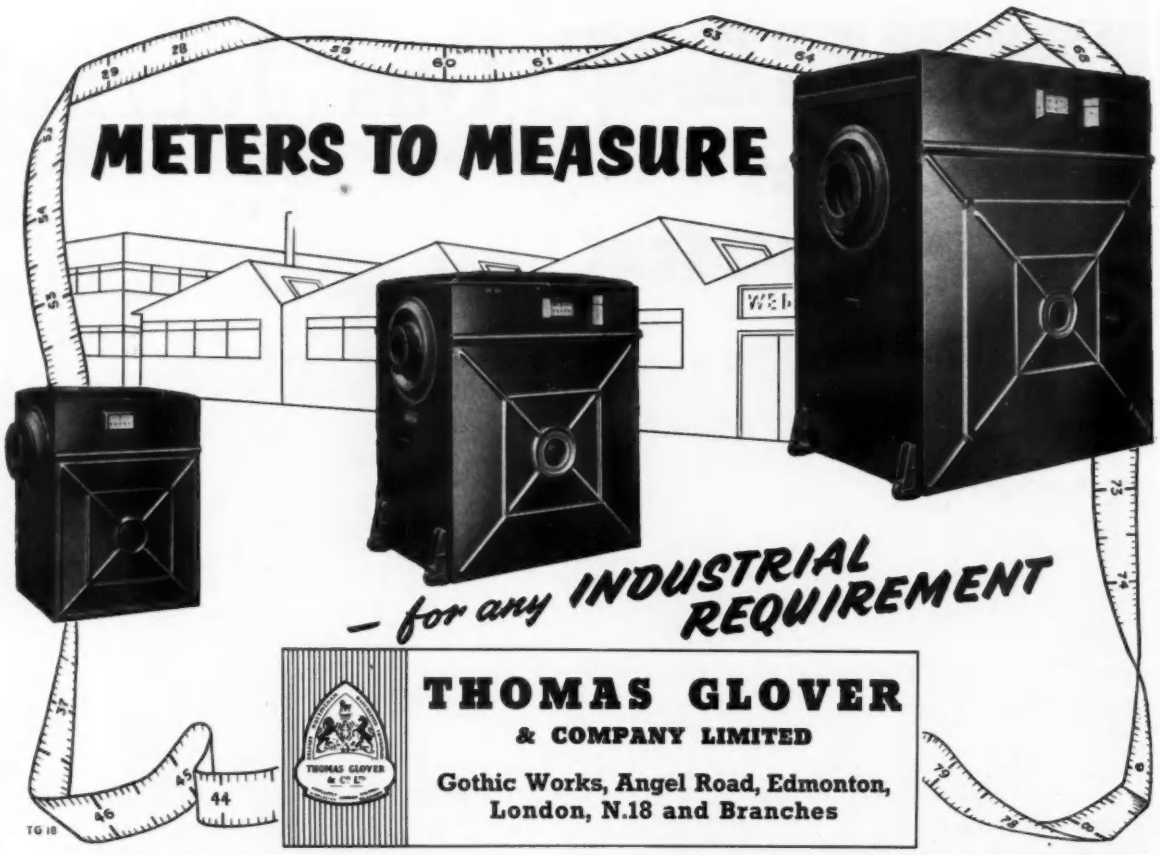
TECHNICAL RECORD

New Aspects of Distribution Technique. By A. D. L. Copp .. 383
The Strasbourg Gas Meeting .. 387
The North Thames Non-domestic Load. By N. R. Junkison .. 389
Smoke Prevention. By A. Marsh .. 392
F.E.I. and Increased Efficiency. By J. C. Macdonald .. 397

NEWS OF CURRENT EVENTS

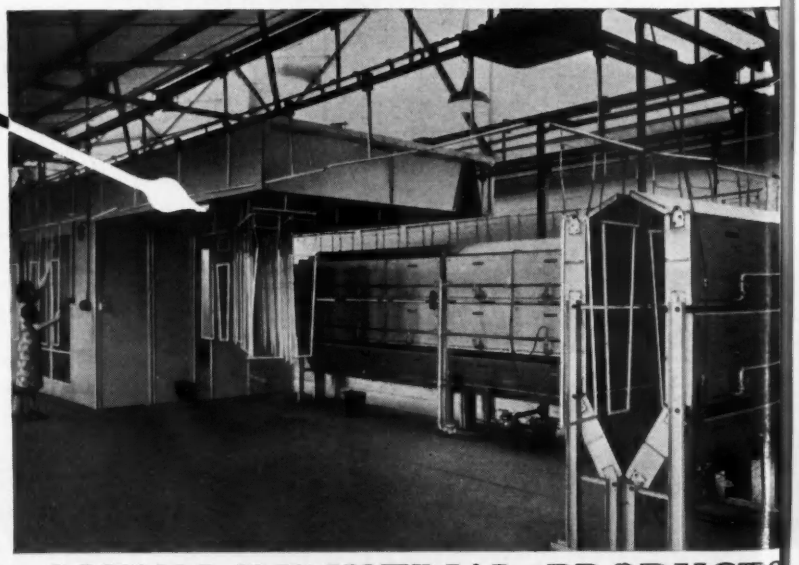
Personal .. 382
Obituary .. 382
Diary .. 382
Institution Autumn Research Meeting Programme .. 391
Coke Sales Circle—Visit to Beckton .. 399
Wales Washing Competition .. 399
Bon Viveur at Middlesbrough .. 399
Millions to See C.U.C. Display .. 399
Visit to Consett Iron Company .. 399
British Road Tar Annual Dinner .. 400
Gas Pressure-drop Scare .. 400
Gas Industry in Ulster .. 400
Manchester Section I.G.E. .. 400
Midland Juniors Visit to Meters Ltd. .. 403
Sales Challenge in North West .. 404
Move to Raise Dublin Gas Prices .. 404
Power-Gas to Build I.C.I. Plant .. 404
Gas Consultative Councils .. 405
Mr. Therm Takes a Wife .. 405
Wales and Mon. Juniors Learn Public Speaking .. 405
'Aluminium in Building' .. 405

PUBLISHERS' NOTICE, SEE PAGE 407



WITH **GAS INFRA-RED**

for finer faster FINISH



Production leaps ahead wherever GAS INFRA-RED is installed. This Parkinson and Cowan process not only speeds up drying, thereby cutting manufacturing costs, but also imparts a better finish. Let us tell you how GAS INFRA-RED can help in *your* factory.

Installation of 40 Panel Units complete with Overhead Monorail Conveyor stoving ironing board frames in 4 minutes. The application of paint for this process is by electrostatic equipment.

By courtesy of Home Ease Limited

PARKINSON AND COWAN INDUSTRIAL PRODUCTS

(A DIVISION OF PARKINSON AND COWAN LTD

DEPT. Q, COTTAGE LANE WORKS, CITY ROAD, LONDON ECI · TEL: CLERKENWELL 1766

Gas Journal

VOLUME 284. No. 4823. NOVEMBER 9, 1955. 107th YEAR

The Second Reading

WHEN the Beaver Committee submitted its Report on Air Pollution many people thought that it would join the sad procession of those which had already been published on similar subjects and then effectively pigeon-holed. However, such was not to be its fate. A combination of circumstances ensured that it received the public support which the others appeared to lack. And the rigorous intervention of Mr. Nabarro in Parliament last winter, on behalf of a clean air policy, will be well remembered. His action in tabling a private member's Bill last winter gave the whole subject just the impetus that was needed to spur the Government into proposing its own clean air legislation. On Thursday last the Government Bill came up for its second reading, and in its passage evoked a great deal of comment from members of both sides. The speakers of both Left and Right, so often divided in their views on domestic matters, joined in unison to express their disappointment with the provisions of the Bill. This, they thought, did not go nearly far enough, nor fast enough, in its appointed task of abolishing smoke from above our cities. 'Miserable hypocrisy,' and 'spineless and lifeless,' were just a couple of the epithets levelled at it by disgruntled members. Even the more restrained contributors to the debate declared their deep conviction that this important subject should not be trifled with and that the Bill, as at present formed, contains too many escape clauses. Mr. Duncan Sandys, Minister of Housing and Local Government, replying, said that the enthusiasm for clean air which had been expressed in the debate reflected the widespread interest and support for this policy which existed throughout the country. He said that he did not want, anymore than anyone else, to 'water down clean air.' Everyone wanted a measure which would be effective and workable and which would achieve results as quickly as possible. It remained the Government's intention to make the Bill as effective, tight, and strong as possible, consistent with what was practicable.

The operative words in the above statement are, in our view, 'effective and workable' and 'practicable.' Members of Parliament who have come to expect swift alterations in the course of events as a result of their enactments were somewhat surprised that a period of years should be proposed for the implementation of smoke abatement. They felt that the process might be vastly speeded up. And so it might, if the amount of fuel required by all classes of consumers could be found readily in a smokeless form, or if the necessary plant for burning coal smokelessly could be made available widely and quickly. Unfortunately, this is not the case. If, at short notice, the gas, electricity and oil industries could provide all that was required in the way of smokeless fuels it would have been possible for the Government to give this Bill a much greater sense of urgency than it possesses at present. In the circumstances, however, it was only reasonable that flexibility should have been provided in the regulations, for nothing is worse than a law which cannot be properly enforced. After all, it would be useless to establish smokeless areas broadcast if there was not sufficient smokeless fuel available to meet all legitimate requirements in those areas.

Clearly, the first thing to do is to increase the quantity of smokeless fuel available throughout the country. Only as this is done can we expect to see a solution—a gradual solution—to this very stubborn problem. On page 392 of this issue we give abstracts from the paper which Mr. A. Marsh, Director of the National Smoke Abatement Society, recently presented to the Annual Conference of the Scottish Division of that Society. Referring to domestic smoke he said, 'although it would be ideal if the change could be made by going over entirely to gas or electricity, supplemented to an increasing degree by oil (including paraffin), it is generally agreed that we are forced to continue to depend, to a very large extent, upon the continued use of solid fuel. The reason for this is that only with solid fuel can the heavy winter load, including the excessive peaks experienced during the very cold spells, be satisfactorily and economically met.' An important point is brought out here. Although gas and electricity might take a greater share of the heating load, both in industry and the home, neither form of fuel can be stored in such quantities, or produced at such a rate, that they can, alone or together, meet the whole of our heavy winter demands. As yet, nothing can take the place of the consumer's stock of sufficient solid fuel to meet his own winter space heating load. From this one is drawn to the conclusion that what is required is a simultaneous increase in the out-

put of refined heat and solid smokeless fuel. And, inevitably, one asks, where can this be found better than in the gas industry?

It is to the gas industry before all others that the nation will turn for its smokeless fuels in the years that lie ahead. Obviously, carbonization is the answer to the problem of producing solid smokeless fuel from our chief, and only, indigenous fuel, coal. And it is the gas industry's job, as the country's major carbonizing industry, to see that this raw material is processed as efficiently as possible. There can be no doubt that more coal, much more coal, will be required by the industry and also a lot more carbonizing plant. The case for gas and coke was never stronger than it is at the present time, and in providing these fuels the gas industry is rendering the nation a service which no other industry can perform so well. This plain fact should be stated over and over again until the powers-that-be and the nation at large fully understands it. If we are to have sufficient solid smokeless fuel, without which the Clean Air Bill will have no meaning, then it is high time that the gas industry made a few more full-blooded protests about shortage of coal supplies and cuts in capital expenditure on new plant. If the Government wish to see our precious coal resources used to the utmost advantage, and if they want a smokeless Britain, then here is the way, the only way, that they can do it. Let the gas industry have the millions of tons of coal that are being squandered yearly throughout the country by inefficient use, and let it have the plant from which to produce, not only the highly refined form of heat, gas, but also a much better solid fuel than the coal from which it is derived. Even if an ambitious programme of extension of carbonizing capacity was planned now it would take years to come to fruition. Consequently, if the Clean Air Bill, now past its second reading, is not to prove completely abortive, no time should be lost.

WEST GERMAN SCIENTIFIC RECOVERY

THE extraordinary industrial recovery in West Germany since the devastation of the latter part of the war has excited considerable comment in the past few years. A book which is nothing more nor less than what its title implies—*A Brief Review of Science and Technology in Western Germany*—has been published for the Department of Scientific and Industrial Research by H.M.S.O. (4s.), and from its pages one can see that the post-war German approach to re-planting the scientific soil at least has been both intelligent and energetic. The review outlines the steps taken to rebuild laboratories, encourage the activities of learned societies and bring scientific records and literature up to date. The almost complete collapse of scientific and technological activity in Western Germany made it possible to rebuild the structure of its scientific and technical organization on modern lines. Today, therefore, the country has gained a position among the world's leaders in technology, although it still lags behind in those fields—aerodynamics, radar and nuclear science in particular—in which applied research was restricted or forbidden bw post-war controls.

The review reveals that one of the fields where recovery has taken place with astonishing rapidity is the chemical industry whose present level of production and export almost equals that of the United Kingdom. In the coal and gas industries, too, new ideas for transport and storage are being used. A hydraulic pipeline is being used in the Essen area to convey 1,000 tons of coal daily from coal-field to power station. Gas is being distributed from the Ruhr by means of a pipeline system 2,000 miles in length. Experiments are being made in the underground storage of gas in natural formations in worked-out oilfields, a method which, if successful, will make possible great savings in the provision of gas storage facilities. It is estimated that coke production is now almost double that for 1938 and that, when plans for increased investment in the industry have materialized, the production for Western Germany will be greater than the peak pre-war period for the whole of Germany. In a letter to Sir Ben Lockspeiser, Secretary of the D.S.I.R., Professor Dr. Otto Hahn, President of the Max-Planck-Gesellschaft for the Advancement of Science, pays generous tribute to the contribution of the United Kingdom authorities in the rebuilding of West German science.

FUEL CAMPAIGN

IN several recent leaders we have commented upon, and offered advice aimed at the amelioration of, the continual fall in coal production. As we have suggested, there are generally more ways than one of tackling a problem. Advice concerning this particular question has, so far, dealt only with the halting, and eventually the reversing, of the production slide. Last week Mr. Geoffrey Lloyd, the Minister of Fuel and Power, put forward another, complementary but not supplementary, answer to this unfortunate situation. He announced that the Government is to launch a new campaign for fuel efficiency in industry which aims at a reduction of 10% in industrial coal consumption, thus effecting a saving of 2 mill. tons of coal during the winter months. At a meeting in London with representatives of the National Production Advisory Council for Industry, he outlined the Government's plans for meeting any possible coal shortage this winter. In the event of any serious shortage, the Government would protect vital supplies for power stations, gasworks, iron and steel plant, railways, and house coal, by spreading the shortage over the rest of industry. The National Industrial Fuel Efficiency Service and the Regional Boards for the various industries have said that they are ready to give all possible help. Subsequently Mr. Lloyd said that production from the mines during the winter rather than the stock figure was the important factor. Even with a severe winter, things would be all right if coal output recovered from the disappointing levels of recent months. But, we submit, that does not, at present, seem likely.

Details of how the 10% reduction in coal consumption is to be put into effect have not been published, but perhaps we can offer a few pointers. It is obvious that most of the vital industries, gas, electricity, railways, and steel which are large consumers of fuel, are necessarily careful about their consumption. In other industries, fuel costs do not form an important part of total costs, and as a result there has been little incentive among them, particularly as the price of coal has been kept artificially low, to make their use of fuel more efficient. The *Manchester Guardian* suggests that if more attention was given to domestic fuel economy, the desired reduction in consumption would be achieved without bothering the industrialist. That is certainly a point that might be considered, but, owing to the enormous numbers of domestic consumers it is a difficult idea to put over. On the other hand, if, as a part of its campaign, the Government could persuade the smaller industries to change over from coal-burning equipment to wholly gas burning equipment then a much more considerable saving could be effected. It should be impressed upon industrialists that gas can be used and controlled so much more effectively than coal as a fuel, that it would be worth their while to make the change, and

that the cost of the changeover would soon be recovered. The exploitation of coal could well be left to the gas industry, which industry makes the best use of it. By this means a greater amount of power per ton of coal consumed could be made available to all concerned.

SERVICE FOR THE ELDERLY

LAST week the East Midlands Gas Board held the fifth annual conference of their Sales and Service Circle, with varied fare enjoyed by a large attendance. The programme included the showing of Part I of 'Gasmanship,' the Gas Council's new sales training film. This was undertaken at the suggestion of the East Midlands Board, and their Marketing Officer, Mr. J. R. Knott, was one of the small national panel who prepared and advised on the script. The next issue of 'Gas Service and Domestic Coke' will report details of the conference; here we would like to call attention to a highlight of service developed by the Board in connection with their new promotional tariff. That is the special care and attention paid to the home installations of the elderly and infirm. In the course of his address opening the meeting, Mr. Sydney Smith remarked that hardship was not found in a special group, but rather in individual cases; and the causes of hardship tended to be individual also. They were not legally able to offer their fuel at lower prices to special classes of consumers, but there were other things they could do. They could offer services rather than be asked to provide them, and regard such cases as top priority. Checking installations, repairing faulty connections, replacing obsolete equipment with more modern appliances; all could lighten the burden of an over-strained purse. Since April 1 this year the Board had made contact with 18,500 elderly or infirm consumers and, so far, had examined the gas equipment and installation of over 13,500 of them. This way a free service designed to keep the house as safe as it was traditionally said to be. 'Our action,' concluded the Chairman, 'is, I think, a major contribution to the welfare of the community; and this form of service is one which the Board look upon as a continuing responsibility. For some, service means pipes and fittings and the fixing of appliances; for others courtesy and speed in the handling of complaints. To me it means an attitude of mind that should pervade every part of our business which brings any of us into personal contact with a member of the public.'

CLEANING-UP OPERATION

CONSIDERABLE interest has been aroused recently in the national Press in the maintenance of gas appliances in a clean state, more particularly gas cookers. It is quite clear to most housewives that even the most streamlined cookers are prone to collect dust and dirt behind them, and, when fitted between other appliances, at the sides. It had been stated that modern cookers can fit flush against a wall, but pipes and wainscotting prevent this in many cases. Even with forward-facing flues, particles of food, and dust and often kitchen utensils find their way behind the cooker.

It would seem obvious that this is a problem which must be solved if gas cookers are to effectively compete with their electrically-operated counterparts, which can all without exception be easily moved from their normal position. The use of flexible couplings seems an easy solution; indeed, the principal manufacturers claim that their products are eminently suitable for gas cookers and that they will withstand pressures as high as any found in domestic gas appliances. But many objections are raised by the area gas boards. One states that they will fit flexible couplings, but prefer not to, and do not publicize the fact that flexible couplings are available, claiming that they are dangerous because of the pressure build-up while an appliance is not being used! Yet another says that the use of flexible couplings is 'not general practice' and they 'do not think it would be very safe.' These excuses seem to stem from a reluctance to admit that there can be merit in anything new. In particular it has been pointed out that it is necessary to have a level floor for a gas cooker to operate efficiently. There is little doubt that ingenuity could easily overcome this small problem, for example a form of telescopic leg would suffice or the floor itself could be levelled during installation.

In former years when cookers were free-standing this particular problem of cleaning did not arise since the cooker was easily approachable on all sides. In these modern times however, a cooker or a refrigerator—for the same difficulties occur with them too—will, in nine cases out of every ten, be incorporated with cupboards and other appliances to form a neat, compact, unit. The cooker is surrounded but not so perfectly sealed in as to prevent the accumulation of dirt. It is imperative that a way be found to pull a cooker away from its normal position, and if gas appliances are to maintain their superior sales appeal, this way must be found quickly.

GAS ON THE FARM

RUMOUR has it that the Gas Council's stand at the Dairy Show held at Olympia last month would have won a prize had it not been for the fact that it was the product of a nationalised industry—the implication being that such industries have greater resources at their disposal. In point of fact this was a particularly inexpensive stand to produce, and its superiority lay in good design and expert use of colour. In the past we have criticized the Gas Council for exhibiting agricultural equipment in surroundings out of keeping with those in which it would normally be found. This year, however, although the stand itself had nothing farm-like about it, this omission did not seem to matter. The warm red of the stand provided a perfect background for the gleaming appliances, and the whole exhibit served to show that despite the many uses for electricity on the modern farm, gas still has much to offer. We were glad to see that overhead panel heaters were given a prominent place. In the past space heating has been somewhat neglected in this connection, but in point of fact there exists a very substantial potential load for space heating in farm buildings. A notable exhibit was the 50-gal. steam-heated pasteurizer manufactured by T. Giusti & Sons, Ltd., and steam raising boilers were represented by the '4.S.' model manufactured by the Controlled Flame Boilers, Ltd., and on the coke side, the 'Taycoke' of Robert Taylor & Co., Ltd. Apart from the 'Mastertherm No. 2' overhead heater of Radiant Heating, Ltd., and a 'stylized' panel heater and storage sets of De La Rue, the rest of the exhibits were of a domestic nature. Oddly enough, the only domestic gas appliances shown were water heaters, whereas there might have been a solid fuel cooker and a number of solid fuel stoves as well. Surely it is not unreasonable to suppose that if a farm has a gas supply for steam raising plant or other agricultural uses, the farmer's wife may choose to have a gas cooker?

Despite a slight rise in unemployment, total numbers at work in September were 270,000 more than a year ago. About 23.03 mill. were in civil employment, approximately the same as in August, and 790,000 were in the armed forces. Manufacturing industry gained 49,000 workers, 24,000 going into engineering and metal-goods and 8,000 into vehicle-making. The engineering industries have gained 131,000 workers in the last 12 months.

Personal Notes

MR. R. KELF-COHEN, C.B., has left the Ministry of Fuel and Power, where he was Under-Secretary (Coal), for a post in the world of commerce.

MR. J. T. LEONARD, A.C.A., and MR. I. M. SMALLWOOD, B.A. have been appointed to the Board of Carless, Capel & Leonard Limited, refiners of petroleum and coal tar naphthas.

MR. T. L. DAVIES, B.A., has been appointed Industrial Relations Officer to the Wales Gas Board. He will succeed Mr. W. E. Crowley who retires on December 31 next. Born at Ammanford, Carmarthenshire, Mr. Davies joined the staff of the Wales Gas Board in 1950 as a Trainee Graduate and since 1951 has been Assistant Industrial Relations Officer to the Board. He is 43 years of age.

MR. JAMES HOWIE MITCHELL, an Assistant Secretary in the Ministry of Labour and National Service, has been appointed Deputy Director-General (Manpower and Training) in the Industrial Relations Department of the National Coal Board. The appointment is a new one, and is consequent upon the establishment of this new department, as recommended by the Advisory Committee on the Board's Organization, presided over by Sir Alexander Fleck, K.B.E.

MR. T. W. AIKEN has been appointed Sales Director of The Bryan Donkin Co., Ltd., and MR. C. W. ASHTON has been appointed Works Director of the Company. Mr. T. W. Aiken commenced his engineering career at the end of the first World War. In 1928 he was promoted to Sales Engineer and transferred to the Manchester Office of the Company, and in 1948 became the Chief Sales Engineer. Mr. Aiken is well known in the gas industry and is a Member of the Institution of Gas Engineers. Mr. C. W. Ashton started work with the Company in 1928, and has also served for a time on the staff of British Furnaces an Associate Company. He was appointed Works Manager in 1947 and is a member of the Institute of Works Managers.

MR. F. J. WORTHINGTON has retired from the South Western Gas Board, with whom he was the Honiton district manager, after serving 51 years in the gas industry—and his son, Mr. G. F. Worthington, is the new manager. Three generations of the family have worked in the gas industry. To mark the occasion, Mr. F. J. Worthington's colleagues in the East Devon area met at the Board's Exmouth showrooms recently to present him with a certificate of long service, a cheque, and an occasional table. Mr. J. W. Denton, district engineer and manager, made the presentation. The Worthington family has been connected with the gas industry for about half of the period since gas was first used for lighting purposes.

Diary

November 10. — EASTERN JUNIORS: Address by L. W. Andrew; followed by a tour of Watson House Laboratories, London.

November 10.—INSTITUTION OF CHEMICAL ENGINEERS. Graduates and Students Section: 'Small Scale Gas Liquefaction', F. E. Hoare. Technical College, Huddersfield. 7 p.m.

November 11. — SOUTH EASTERN G.C.C.: West Surrey District Committee. 43-45, London Road, Morden. 2.45 p.m.

November 12. — YORKSHIRE JUNIORS: Gas Showrooms, Britannia House, Leeds Road, Bradford. 'Works Efficiency,' J. Painter. 2.30 p.m.

November 14.—BRITISH GAS SALESMEN'S CIRCLE (Eastern Area—Tottenham Division): 'Salesmen by Accident, and Salesmen by Conviction', D. R. Griffiths, Gas Showrooms, Sydney Road, Enfield. 7.15 p.m.

November 15. — SOUTH EASTERN G.C.C.: East Surrey District Committee. 908, Brighton Road, Purley. 2.45 p.m.

November 15.—WOMEN'S GAS FEDERATION: 11th Branch Conference. Caxton Hall, Westminster. 10 a.m.

November 16.—EASTERN GAS BOARD.—Cambridge Salesmen's Circle. Reports from delegates who attended the Sales and Service Conference.

November 16.—INCORPORATED PLANT ENGINEERS, Kent branch: 'Refrigeration and its Applications,' B. F. Brown. Bull Hotel, Rochester, 7 p.m.

November 16.—LONDON AND SOUTHERN JUNIORS: Visit to Ministry of Works, Whitehall Gardens.

November 16.—SCOTTISH GAS BOARD, SALESMEN'S CIRCLE (Western District): 'Large Cooking Equipment', G. A. Brooke.

November 16. — WALES AND MON. JUNIORS: North Wales Section. Visit to Begwaco Meters, Ltd., Queen Street, Farnworth, Lancs.

November 17.—MIDLAND JUNIORS: Half day visit to Nechells 'B' power station.

November 17.—SOUTH EASTERN G.C.C.: Metropolitan District Committee. 4-6, Wandsworth Road, London, S.W.8. 2.30 p.m.

November 18.—SOUTH EASTERN G.C.C.: Kent County Committee. 95, High Street, Rochester. 2.30 p.m.

November 21. — WEST MIDLANDS G.C.C.: Committee Room, Gas Offices, Edmund Street, Birmingham, 3, 2.30 p.m.

Obituary

MR. GEORGE C. PEARSON, O.B.E., M.I.C.E., F.INST.F., a former President of the Institution of Gas Engineers and Chief Engineer to the Birmingham Corporation, died at Teignmouth Hospital on November 6, after a fall. Mr. Pearson, who was 71, had spent his whole career in the Birmingham Gas Department. At the age of 16 he started work as laboratory assistant at Saltley Works under the late Mr. Henry Hack. After some years in the laboratory he was appointed Coal Test Works Superintendent and was closely identified with the testing of coals, coke and other raw materials and raw products. In 1915 he transferred to Windsor Street Works as Superintendent and four years later became Engineer. During his service at Windsor Street the works doubled in capacity, chiefly by the introduction of vertical retorts. In 1936, Mr. Pearson was appointed Engineer-in-Chief. During the war, Mr. Pearson, in common with the engineers of other undertakings, was faced with difficult problems, not only in Birmingham, but also with other undertakings within the Midland Region, where he acted as Regional Gas Engineering Adviser. In 1946 he was elected President of the Institution of Gas Engineers, and in the same year King George VI honoured him by making him an Officer of the Order of the British Empire. In 1948 Mr. Pearson retired to Devon.

MR. SEYMOUR BOOTH, a Director of the British Vacuum Cleaner and Engineering Co., Ltd., has died. He was born in 1874 and joined the organization in the year 1904.

MR. WILLIAM EDWARD BIRCH, a senior clerk on the Swindon staff of the South Western Gas Board, has died, aged 56. Mr. Birch joined the Swindon United Gas Company in 1936 as a district salesmen. During the war he was transferred to the clerical staff.

MR. H. DOUGLAS LEES of Hexham (Northumberland) who held an executive position with the Northern Gas Board. Newcastle-on-Tyne, has died in hospital at the age of 58. Mr. Lees was the son of the late Mr. Herbert Lees, J.P., who was Managing Director of the former Hexham Gas Co. Mr. H. Douglas Lees was manager of the Hexham plant for a time. He was a member of Hexham Urban Council for eight years until 1949 when he resigned through ill-health.

New Aspects of Distribution Technique*

A. D. L. Copp, A.M.I.C.E., M.Inst.Gas E., Distributing Engineer to the North Thames Gas Board, concludes his description of some of the latest techniques practiced by this Board in the laying and protection of gas mains.

THE first efforts on cathodic protection were started by the Gas Light & Coke Company in 1947 in a most aggressive type of soil, *i.e.*, that in South Essex. Aluminium anodes were used, and these gave only a small negative potential, so that no success was achieved. Later a switch to magnesium anodes was made, with improved, but not perfect, results. More recently careful analyses have been made of all the features of these installations, and as a result certain principles have been adopted for guidance. These are the necessity for the very best dielectric wrapping or sheathing (this rules out economical application to old pipes), perfect electrical continuity in the pipeline, finite limits to the protected area, and insulation of house connections.

Cathodic Protection

If electric power is cheap enough, protection can be given even under 'bare metal' conditions, but this is rarely found to be the case. Electrical continuity is attained by continuous welding, or by the use of purpose-made bonds similar to those used by the Railway Executive. The bonds have the merit that the copper to steel weld is factory made, so that only steel to steel welding is made on site, and these bonds are used around Johnson couplings. Thermit welding (Fig. 10) is used extensively by the North Thames Board, and always for welding copper leads to steel pipes; the process is to place a quantity of thermit in the cast iron box (Fig. 11) with the copper

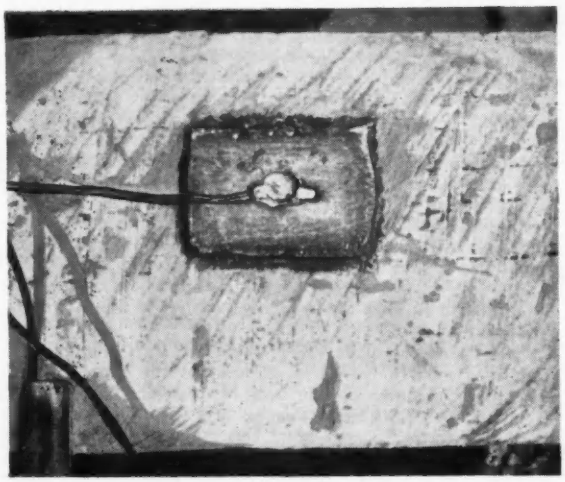


Fig. 10. Thermit weld showing weld completed.

wire lead inserted through the slot at the pipe surface, and to ignite the thermit by a purpose-made cartridge. Our results are not 100% perfect, but the occasional fault of lack of fusion is easily detected.

Finite limits to protected areas may not be altogether a sound procedure, but in the developing stage in which we are placed, they have the merit of enabling us to deal with two or three streets as a unit; insulation from mains in gas continuity is achieved by the use of Johnson couplings.

It is the rule, where possible, to include the service in the protected scheme, so that insulation is effected at the meter by a specially adapted union. This is really a standard union

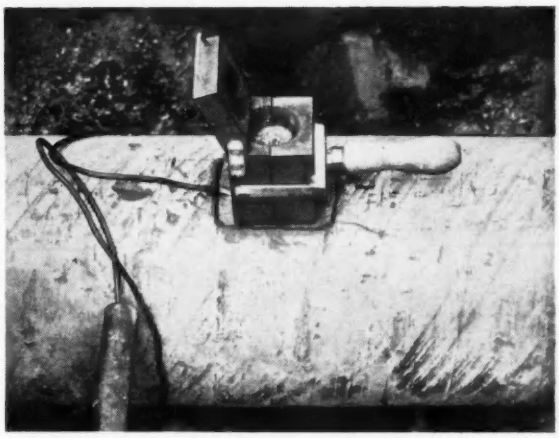


Fig. 11. Thermit in box in readiness for welding.

shaved down here and there to accommodate the insulation. That around the lining is in halves, so that it can be fitted after sweating the 'lead.'

It should be pointed out that as the maximum recommended voltage employed is -2.5 ($Cu/CuSO_4$), small resistances are ample, and insulation of the order of 2,000 ohms is more than good enough. Where these unions are used the apparatus cannot be earthed through the gas installation.

Trials have been conducted of impressed current installations; in Harrow, on a 24 in. cast iron main, and at Pitsea on a steel network. A brief description of these may be instructive.

In Harrow we found a 24 in. cast iron main seriously corroded in made-up ground, and over a length of 200 yards. The protection to the metal was the usual 'dip,' and the pipes had been interred 25 years. Sacrificial anodes were applied in November, 1952, at intervals of eight yards on a collector cable, but the voltage attained did not exceed -0.78 and the lowest reading was -0.645. The resistance of all the lead joints in series was only 3 ohms, but as there are anærobic bacteria present, full protection required -0.95 V. The resistivity of the soil varied from 450 ohms per cm. down to 100 ohms per cm. Anode output averaged 200 mA. Clearly we were dealing with bare-pipe conditions.

Some of the backfill consisted of ashes and, therefore, contained carbon, which contacted the pipe, and it was thought this mass absorbed some of the protective current. It was considered possible that by applying a heavy impressed current for several days the main could be polarized, so that the anodes would thereafter maintain the depressed potential to a satisfactory level.

The current contemplated was ten times the total anode output, and was actually 42 A at 9.5 V at switch-on, when the solution potential of the 24 in. pipe varied between -1.02 and -1.42 V. Seven days later the current had fallen to 33.5 A. and the solution potentials had mostly risen slightly, so 40 A. was restored on 11.5 V. This resulted in P.O. cables potentials being ennobled by an average 30 mV, which was permitted only on a short-term basis.

After three weeks the rectifier was switched off and within an hour solution potentials had dropped to an average -0.8 V. which was disappointing. A month later potentials had returned almost to those obtaining before application of impressed current. It would seem, therefore, that this tech-

* From a paper presented to the London and Southern Section of the Institution of Gas Engineers on October 18.

nique, so often successful with underwater structures such as piers and jetties, may well be of little use for buried pipelines.

The Pitsea experiment was on a far more ambitious scale. Fig. 12 indicates the area and shows the steel gas mains which it was desired to protect. Prior to the trial all the other authorities with underground plant were approached and sent representatives to a meeting at which our proposals were dis-

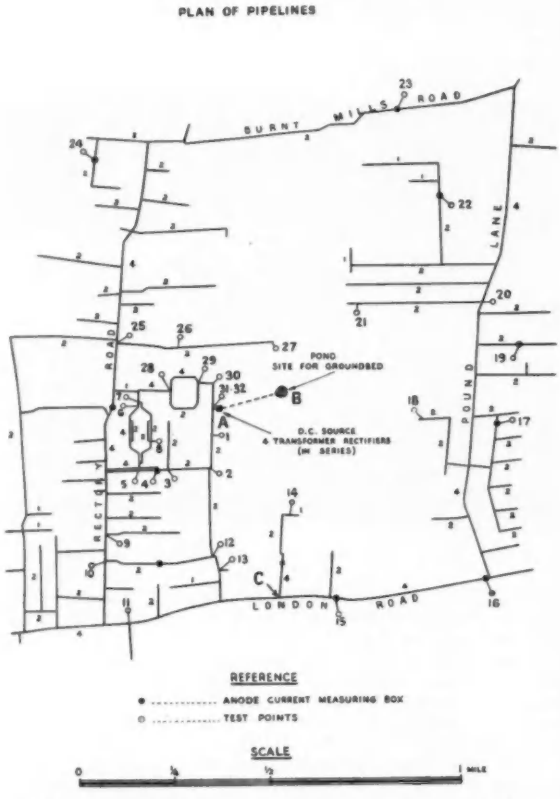


Fig. 12. Cathodic protection: Pitsea area of protection.

cussed; it was agreed in principle that costs of a permanent scheme might be shared in proportion to any benefit derived, and all agreed to conduct the necessary surveys of their own plant at their own cost.

The drainage test was conducted with a view to ascertaining:—

(1) The general feasibility of a comprehensive scheme of cathodic protection for the area;
(2) current requirements for such a scheme; and
(3) the bonding which would be necessary to ensure that any such scheme should not cause undue interference with buried metal pipelines, cable armouring, or cable sheathing, belonging to the other utilities.

Previous site investigation resulted in the decision being taken to use the pond shown at point B in Fig. 12, as a site for the groundbed; and the D.C. source, which consisted of transformer rectifiers connected in series, was located in a hunt on the verge of Crown Avenue (point A).

The positive lead cable was run overhead from the hut to the pond and connection was made there to a 60 ft. length of mild steel rail positioned at the bottom of the pond. The negative connection was made directly from the hut to the adjacent gas main which, at the same time, was extended by an extra length of approximately 50 yards to connect with the eastward spur from the ring main on the prefabricated housing site. No bonding was attempted initially to any of the other services, although it was known that a number of chance bonds existed between at least gas and water.

At the commencement of the test the apparatus was switched on and off for cycles of two and eight minutes respectively to enable the G.P.O. and British Electricity Authority to determine alteration of potential on other services at various points, and as a result of this it was found by the G.P.O. that there was a simple and continuous gradient brought about by the switching on of the current which rendered their buried cable cathodic from approximately point C onwards, while the length from point C back towards the negative connection to the gas main was rendered anodic. It appeared, therefore, that the G.P.O. cable was electrically continuous and that a single bond at point 5 would possibly enable the entire length of cable to be rendered cathodic. This bond was effected by the G.P.O. with the co-operation of the North Thames Gas Board and drained something less than 0.5 A from the system at a time when a total of 100 A was being drained. This simple bond was apparently sufficient to render the G.P.O. cable cathodic throughout.

Potential alterations with the electricity board's cables, however, showed a slightly more complex behaviour and while the cable sheathing and armouring had to be electrically continuous, it would appear that there was sufficient resistance at various points in the circuit, probably at joints, to render the metallic paths of comparable resistance to the parallel electrolytic paths. Bonding for electricity cables, therefore, appeared to be more a problem of bonding across the electricity board's joints than of bonding between the electricity and gas networks. In view of the time which would have been necessary to determine suitable bonding points, however, it was suggested to the electricity board, who agreed, that their cables should be left out of direct circuit for the duration of the test. The apparatus was then switched on to run continuously for a period of approximately one week and the controlling regulator was set to give a current of 100 A.

Potential depression on the gas main at a point close to where the negative lead had been connected, point No. 31, was found to be depressed by approximately 3.5 V to a value of −4.0 V ref. $Cu/CuSO_4$ immediately, while the potential of the adjacent water main was altered by 0.25 V only, point No. 2. It was thus apparent that while gas and water mains are metallically connected in places there is an appreciable resistance in the connecting circuit, composed of contact resistance and metallic resistance in unknown proportions. In any joint scheme, therefore, additional bonding at a number of positions would be necessary.

Solution potential readings were then taken at points thoughout the area for comparison with the unprotected potentials which had been previously recorded, and these figures showed that the fall off in potential with distance was extremely marked, and that the greater length of the network of mains was very little influenced except at points where spurs extended into the square (*e.g.*, points 14 and 21) to an appreciable extent and where they were not shielded from the anode. The installation was then left running at 100 A, which value did not vary by more than + or − 5% throughout the period and visits were made: (1) after three days, and (2) at the end of one week, to determine the extent of polarization of the main and the resulting 'throw' which had been obtained.

At the conclusion of one week it was found that the potential of the gas main immediately adjacent to the negative bond had. in fact, assumed a more positive value (3.4 V as against 4.0 V ref. $Cu/CuSO_4$) and this was found to be due to the fact that a further chance bond between water and gas, presumably close to the negative bond had been effected during the week. The solution potential of the water main immediately adjacent to this point had in fact been depressed from −0.83 V to −1.66 V during this period. Depression with time at a distance from the point of connection of the negative lead proved to be extremely slight and, for all practical purposes, had to be regarded as insignificant, despite the extremely high current density which was being received by the near section of the gas main.

This was due to the exceptionally heavy volts-drop which occurred along the length of gas pipeline at the current being demanded by the poorly-coated metal. It also rendered cathodic protection by means of applied current impracticable without the installation of a very large number of heavy cross-section conductors in the network from the negative terminal of the D.C. source. In other words, with any given ratio of exposed surface area of metal to cross sectional area of metal, it is only economic to protect up to a certain length from a single point of connection, and at Pitsea this appears to be

the limiting factor in deciding drainage point, numbers and distribution.

The question of volts drop through the metal is one which does not normally arise with ferrous metal pipelines, and this is the first case, to our knowledge, where it has been of such an order as to affect design considerations. It is necessary, therefore, to conclude, in this instance, that cathodic protection cannot be considered as an economic measure for the network as a whole, but can only be applied to correctly isolated replacement lengths as they are installed or when the system is being extended.

Leakage Indicators

Recent innovations in this category are the hydrogen detector developed by Watson House, and the halogen detector; the North Thames Gas Board has accumulated some experience of each.

The hydrogen detector is a convenient instrument which depends upon varying resistance in a hot-wire filament. This is enclosed in the gauze-cloaked head of the probe, and is heated by passage of current from a dry battery. In the presence of even minute quantities of hydrogen it increases markedly in temperature, and the resultant change in filament resistance alters the rate of current flow, which is indicated on the galvanometer. The change can also be adapted to give audible effects. The main instrument box contains the galvanometer together with a shunt, two fixed resistances, a variable resistance to balance the bridge circuit, and a further variable resistance to control battery output. A small compartment with lid is fitted in the rear of the box and this houses the two-cell battery which is connected to the circuit through a single pole tumbler switch. The overall dimensions of the case are 7½ in. by 5 in. by 4¾ in., so that it may be said to be a very convenient portable detector. It gives full-scale deflection when detecting leaks in the order of 0.02 cu.ft. per hour on horizontal and vertical pipes, and comparably in bar-holes over buried pipelines.

It has been found that testing of gas-free mains by injection of a halogen such as carbon tetrachloride is quite admirable. It is generally necessary only to insert the probe into a bar-hole to get results, but to make doubly sure, bar-holes after completion may be sealed at ground level by a suitable plug for a short time so that any local leak can concentrate.

The apparatus is a little limited in easy application because it is desirable to have a light truck alongside in which the electric generator can conveniently be carried. It consists of the detector unit, control unit, and the necessary leads. The former is in the form of a hand-held probe which can be addressed to the pipe or to a searcher hole, and containing at its head a heated element sensitive to halogen gases. A small fan draws samples through the probe. A loud-speaker in the control unit utters a series of regular 'clicks,' and if even minute quantities of halogens are present the periodicity of the clicks is shortened; the more the halogen present, the greater the frequency change.

Another type of detector does not sound regular 'ticks,' but the increase of positive ion current due to presence of a halogen fires a thyratron which operates a buzzer. Power consumption is about 100 W at 250 V.

Odorizing of Gas

In recent months odorizing in a limited geographical area has been practised by the North Thames Board, a proportion of Calodorant C being added to the gas in the proportion of 0.75 lb. to one mill. cu.ft. We have developed an apparatus (Fig. 13) which may incorporate at will either the visible drip feed shown, or a wick holder. The apparatus, in either case, is a bypass on the main supply, and a differential pressure between inlet and outlet indicated by the mercury gauge is obtained by inching up a valve in the main stream.

The odorant is stored in the tank, which is made of a 12 in. steel pipe with welded ends (the installation is on the high-pressure system in South Essex), and flows to the sight-feed through a filter and needle-valve. The horizontal bypass is to provide a stream of gas to sweep the odorant forward. There is balanced gas pressure at all required points, so that the rate of feed is not affected by varying gas pressure. If the gas rate in the main lines goes up, the differential pressure increases, so that more odorant is forced out of the tank.

Half a pint of odorant a day is required by our summer load and this is represented by one drop per 10 seconds in the sight-feed. The lowest constant drip rate achieved is one drop per 20 seconds. It seemed that we were working near the lower limit of capacity, so we diluted the odorant with petrol in the ratio 1/2, so that the required drip rate was one per 3½ seconds. The minute quantity of petrol added per day would be of little cost and would have no affect whatever on the gas. But we could not control the drip because of the low surface tension of petrol, so we changed over to the wick type of feed. We made this up in a couple of hours from a standard

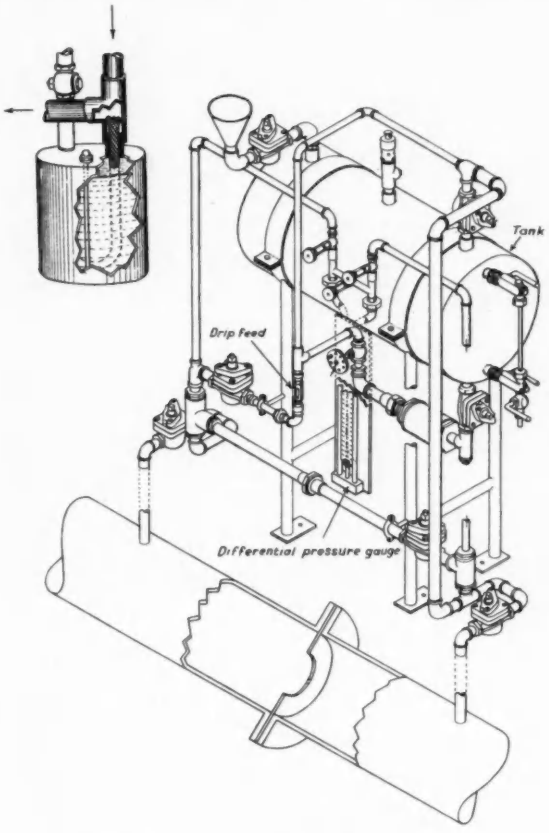


Fig. 13. Arrangement of plant for odorizing gas.

bottle-siphon as fount with a wick protruding through a ½ in. tube into one limb of a 1½ in. equal tee. Gas flows across the wick through the other two branches of the tee, and the amount evaporated into the gas stream depends only on the exposed surface of wick (about ¾ in. proud of the enclosing ½ in. tube) and the rate of gas passing. It is truly volumetric and this type can be used even on individual services if required, and the exposed length and diameter of wick made suitable. The upper limit of rate of main stream gas flow for a proper degree of odorization for one wick is probably 50,000 cu.ft. per hour, but, of course, several wicks can be put into position.

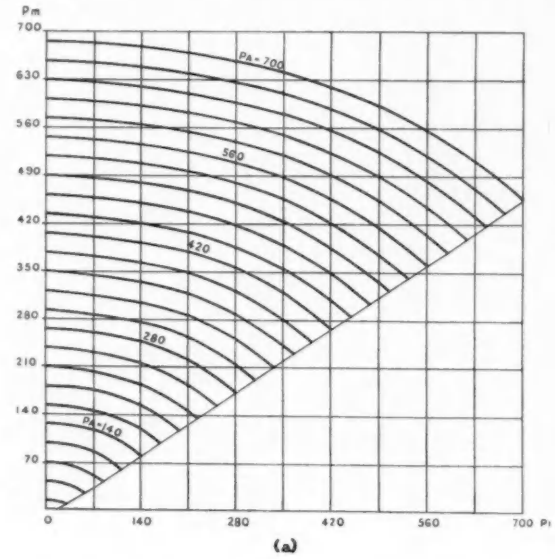
Line-packing

The North Thames Gas Board has for many years partly relied on the reservoir capacity of the South Essex (Grays) high pressure system to meet peak loads, but the advent into full service of the Beckton-Southend 36-miles-long pipeline, part 24 in., part 18 in., provided the first experience of large reservoir capacity for 'line-packing.'

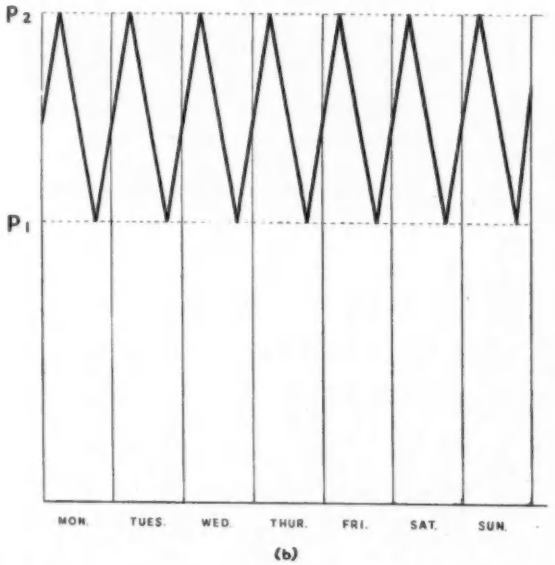
The four pumps at Beckton are positive, invariable speed type, each of 150,000 cu.ft. per hour capacity. Adjustment of delivery can be made only by combinations or by utilizing the 'split' connections on No. 1 pump by means of which one of the two cylinders only may be used. The prime movers are synchronous motors 350 h.p. and it is undesirable that sets should often be stopped and started. There are several holder-stations and district governors fed by this line, as well as

Southend Station as required. The arrangements include for filling of holders overnight where possible so that the load is levelled, but the district governor deliveries, being strictly 'peak,' are catered for by line-packing.

The design pressure of the line is 40 lb. per sq. in., but so far the maximum employed has been 17 lb. per sq. in. There is a distant indicator at Beckton showing pressure at Southend, which is not to fall below 2 lb. per sq. in. Subject to this



(a)



(b)

Pm = Mean effective pressure (lb. per sq. in.).

P_s = Absolute pressure at the origin required for transmission alone (lb. per sq. in.).

P_A = Absolute pressure at the origin (lb. per sq. in.).

Fig. 14. (a) Mean effective pressure in a pipeline used as a reservoir. (b) Daily pressure fluctuations.

over-riding consideration, fluctuating pressure is permitted so that a build-up may occur prior to peak load times after which a fall-off ensues according to the pumps employed and the gas taken off. The pipeline, when pumped up to 15 lb. per sq. in., provides an available storage cushion of 300,000 cu.ft., or two hours' work for one pump.

In considering the economics of packing pipelines it is necessary to distinguish between the natural reserve and the utilizable reserve. The cost of packing should be related only to the latter, and it is a function inversely proportional to the volume of the pipe and the initial pressure. Provided the pipeline is reasonably large in volume, the cost of packing compares favourably with the cost of gasholders.

The volume of gas in a pipe can be written:—

$$V = Ve\ (P_m/P_o)$$

where *Ve* is the water volume, *Pm* the mean absolute pressure, and *Po* one atmosphere.

From this expression it can be seen that it is necessary to know the mean pressure, and hence the pressure distribution along the pipe. When the pipe acts as a reservoir the flow of gas takes place under variable conditions and must itself vary. M. Renouard, in a paper at the 1951 Congress of Gaz de France, made an important contribution to the study of reservoir capacity, and pointed out that the pressure distribution curve in a variable system is tangential at every point to the curve for steady flow corresponding to the values of pressure and flow at this point.

It is possible to deduce and also to measure the rough form of the pressure curve along the line, and so to make a diagram such as that shown in Fig. 14a.

An actual example will give a clearer picture:—

Consider a pipeline of 10 in. nominal diameter and, say, 60 miles length having a normal flow of 325,000 cu. ft. per hour at the input end. Calculation of the pressure losses shows that if P_2 is one atmosphere, the value of P_1 abs. necessary for transmission alone is 160 lb. per sq. in. But the maximum value of P_1 abs. is 426 lb. per sq. in. The graphs in the diagram show that when both these figures are equal to 160 lb. per sq. in. abs, then the mean pressure is 91 lb. per sq. in. abs. When, however, pressure for transmission only is 160 lb. per sq. in. and the maximum value of P_1 is 426 lb. per sq. in., then the mean pressure is approximately 387 lb. per sq. in.

The volume of the pipeline is 174,000 cu. ft. so that the natural reserve is

$$\frac{91}{\text{at } P = 14.7} \times 174 = 1.1 \text{ mill. cu. ft.}$$

and the utilizable reserve is

$$\frac{387 - 91}{14.7} \times 174 = 3.5 \text{ mill. cu. ft.}$$

As far as the cost of energy to utilize the storage is concerned, this is represented by the extra expense necessary to pump the pressure in excess of requirement for transportation alone. It is assumed that the pipes are already strong enough, and so the cost of extra thickness or higher yield stress steel need not be considered.

It would be a heavy task to obtain exact costs, as this would involve determining the pressure curve as a function of time at the pumping end of the line, consequently, a simple daily gas reserve is considered. Let us suppose that each day the pressure at the outlet of the pump is as shown in Fig. 14b and that pressure fluctuates between P_1 and P_2. Even if storage is on a weekly basis, the total energy consumed is proportional to a mean value of the initial pressure, *Pm*.

We can conceive a dimension μ, being a coefficient of utilization of the reserve stock, so that

$$\mu = \frac{Pm - P_1}{P_2 - P_1}$$

If $\mu = 0$, then $Pm = P_1$ and the initial pressure remains equal to the value required for transportation alone. If $\mu = 1$, then $Pm = P_2$ and initial pressure remains at maximum. The reserve stock in the pipe is not utilized.

If pressure fluctuation is as Fig. 14b then *Pm* is at about the mean and μ becomes 0.5.

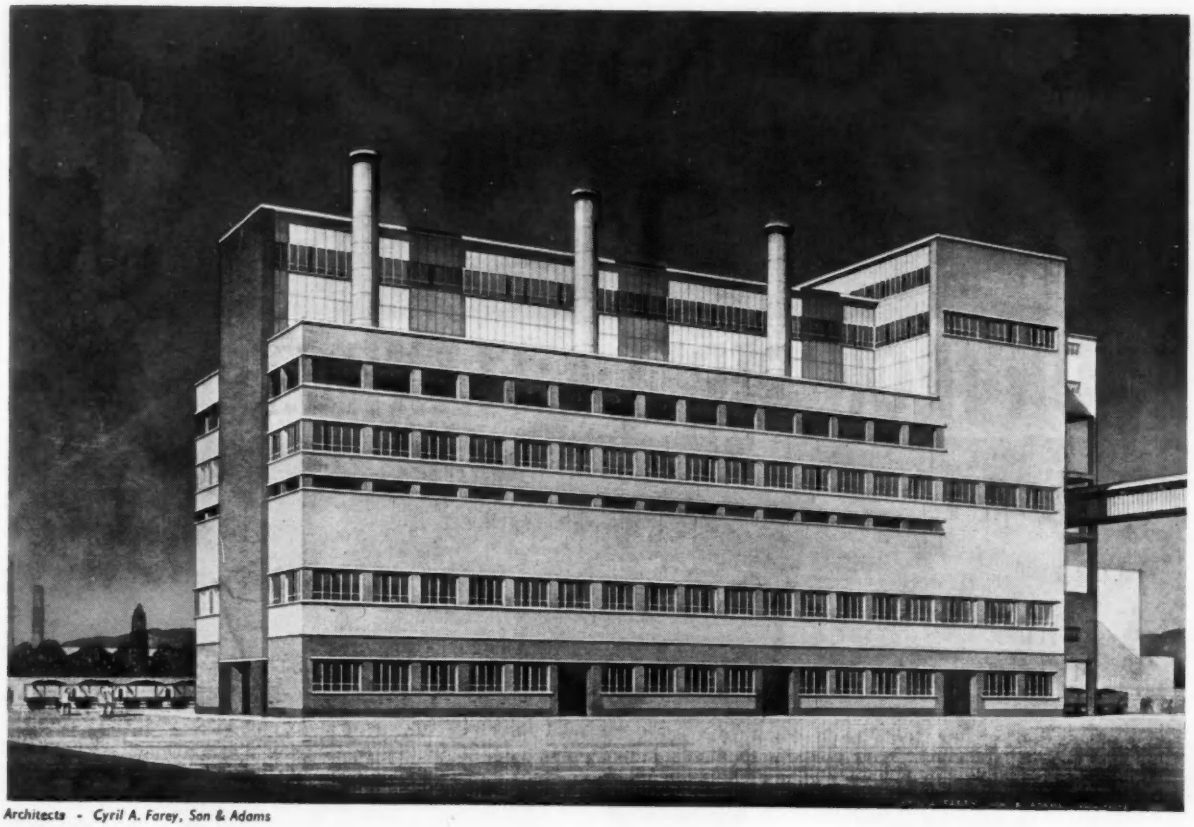
The energy necessary to compress a perfect gas from about atmospheric to P_1 in kWh is $W \log P_1$, where W is a coefficient for the compressor, being about 0.12 for a large reciprocating type. As the energy necessary for storage is the difference between the values necessary to pump up to *Pm* and to P_1, then:—

$$W(\log Pm - \log P_1) = W \log\left[1 + \mu\left(\frac{P_2}{P_1} - 1\right)\right]$$

The annual cost of energy for storage becomes

$$= NQSW \log\left[1 + \mu\left(\frac{P_2}{P_1} - 1\right)\right]$$

where N = number of hours of pumping per annum, Q = flow rate per hour, and S = rate per kWh.



Architects - Cyril A. Farey, Son & Adams

The new installation of

Continuous Vertical Retorts to be built

for the Southern Gas Board at the

Cowley New Works, Oxford

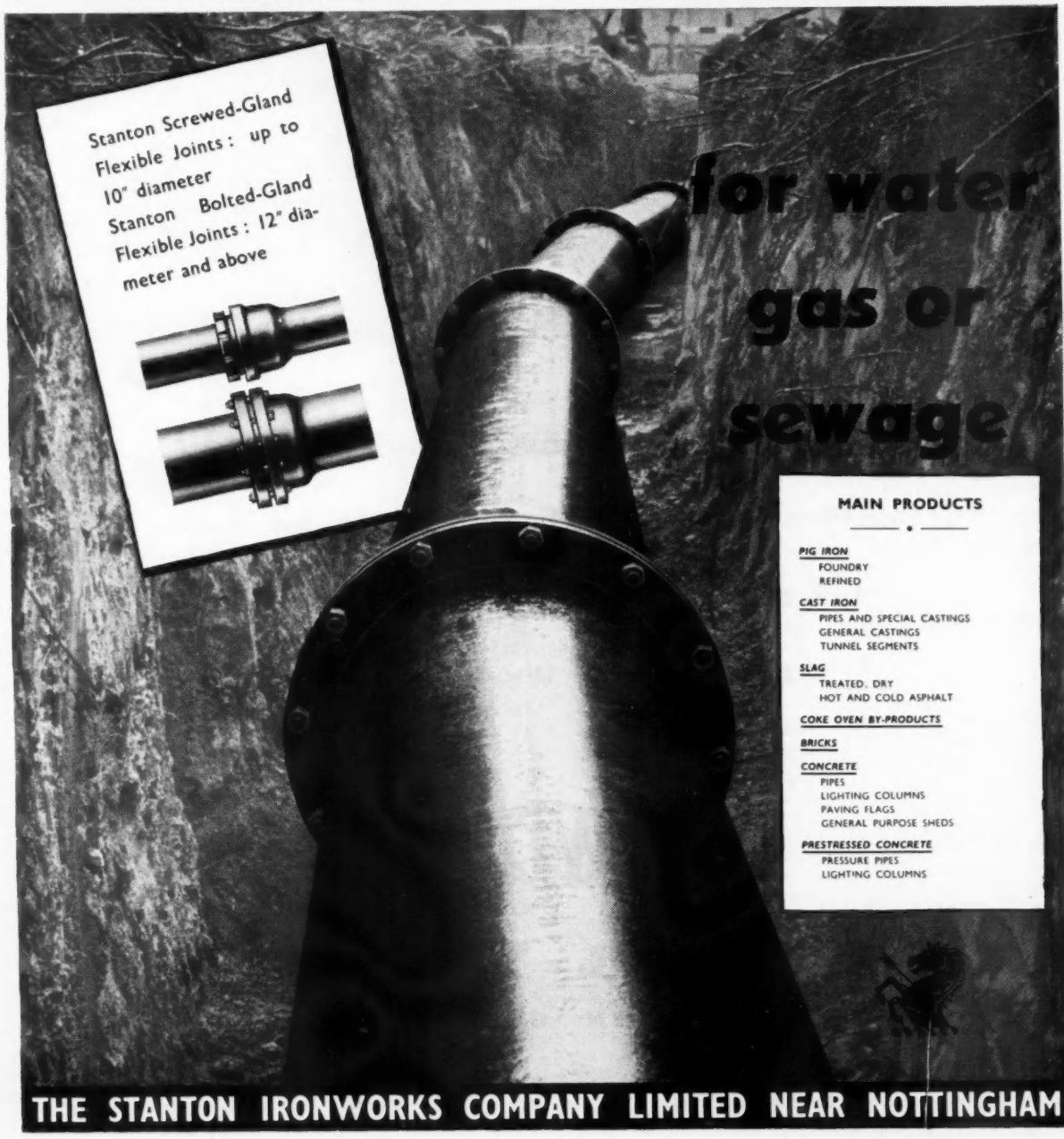
WOODALL-DUCKHAM

CONSTRUCTION COMPANY LTD.

Woodall-Duckham House, 63-77 Brompton Road, London, S.W.3. Tel : KENsington 6355 (10 Lines). Grams : Retortical (Southkens) London

STANTON

SPUN IRON PIPES & FLEXIBLE JOINTS



THE STANTON IRONWORKS COMPANY LIMITED NEAR NOTTINGHAM

THE STRASBOURG GAS MEETING

In these two pages we feature some abstracts from a number of the papers which were presented to the Association Technique de l'Industrie du Gaz en France at the 1955 Annual Meeting in Strasbourg.

AUTOTHERMIC CATALYTIC CRACKING OF PROPANE

ONIA-GEGI Installation at Laval. By Jean Meuric.

LAVAL, a town of 35,000 inhabitants, is about 200 miles west of Paris in the Province of Maine. To the south lies the little town of Chateau-Gontier with 6,700 inhabitants. The two are connected and the total output in the district served was 3,227,000 cu. m. (11 mill. cu.ft.) in 1950 against 1,992,000 cu. m. (7 mill. cu.ft.) in 1938. The works at Chateau-Gontier are shut down. Since December, 1953, an installation of plant for the autothermic cracking of propane on the ONIA-GEGI process has been in operation at Laval.

The plant is in two lines, each with a nominal capacity of 7,200 cu. m. (30,000 cu.ft.) per day of gas at 4,200 cal. per cu. m. (440 B.Th.U. per cu.ft.). It was intended as a means of producing peak load gas or to compensate for large variations in load and to make up for deficiencies in gas storage. It includes a preheater in which propane is burned to heat the charge at starting before admission to the cracking chamber. This was originally fed with cold primary air but later an air preheater was added to raise the air temperature to 450°C. The time required to raise the temperature of the catalytic material in the cracking chamber to working level was specified as four to five hours, but operators preferred to allow six to eight hours. The preheater is followed by the cracking chamber to which propane, air and superheated steam are fed at the base. There was initial trouble here but this was overcome by modifications in detail. The steam is superheated by the sensible heat of the cracked gases.

The cracked gases leave the chamber at a calorific value of 1,900 cal. per cu. m. (200 B.Th.U. per cu.ft.) and after leaving the scrubber are enriched by the injection of propane vapour in a mixing chamber to the required 4,200 cal. per cu. m. The enriched gas, before the addition of the air preheater, had a CO content of 16.6%, and H_2 26.7% with a density of 0.70. After this addition the hydrogen content rose to 32.2% and the density to 0.759. There is no difficulty on the district when the gas is added in proportions of 40% to 80% direct to the coal gas as required. The 'fuel consumption' is 19.7 cu. m. propane per 100 cu. m. gas sent out of which 0.70 is required for air preheating, 8.03 for the cracking, and 10.97 for enrichment.

AUTOTHERMIC CONVERSION OF LIGHT HYDROCARBONS

The role of the contact masse. By P. Agron.

Tests were carried out in an experimental retort consisting of a stainless steel tube, placed vertically, 1 metre in height, 10 cm. in diameter, carefully insulated. A mixture of air and propane was introduced at the top through a small tube placed axially. The products of the reaction were evacuated at the bottom. The composition of the contact masse with which the retort was filled was varied. Tests were made with five varieties of alumina, carborundum, malachite, kaolin, and pure silica.

Three different rates of introduction of propane were tested: 100, 200 and 500 litres per hour, the proportion of air added being constant at 7 to 2. The propane itself was really a mixture of 70% pure propane to 30% propene.

Three conclusions were deduced: The contact masse serves principally as a heat reservoir. The contact masses seem to have no chemical reaction; they cannot therefore be described as catalysers in the usual sense: The total surface presented by a certain volume of the masse appears to play no part. On the other hand, the volume of the pores affects the reaction at low throughputs.

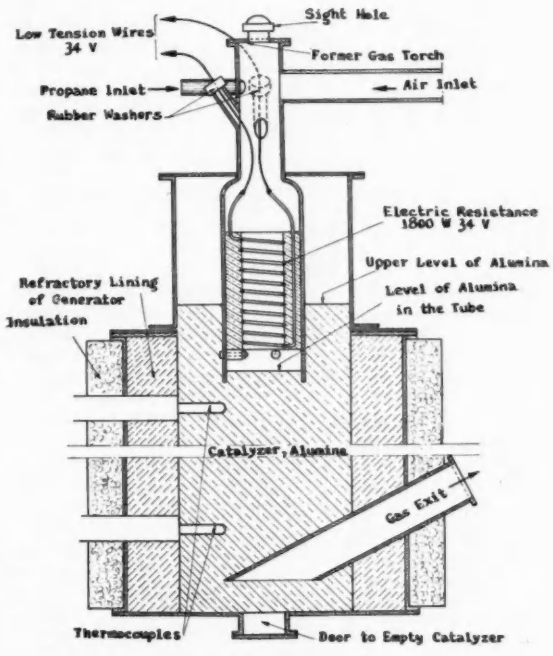
The activated alumina, activalum S17, supplied by the Ste. d'Electro-Chimie d'Ugine, appeared to be the type of masse which, by its physical characteristics, permitted the biggest output over the range. A significant observation was that at about 10 cm. from the point of introduction of the gas and air to the masse the reactions terminate. Therefore, the depth of the expensive alumina can be limited and the rest of the retort may be filled with ordinary silica or other cheap refractory material. To begin the reaction the temperature of the masse is raised to 900°C.

IMPROVEMENTS IN THE AUTOTHERMIC CONVERSION OF PETROLEUM HYDROCARBONS

By L. Hurel and A. Giampaoli.

This paper describes progress made since the paper by the same authors to the Annual Meeting of A.T.G. in 1951, on the conversion of commercial propane. The object of the work is to improve the quality of the product particularly by increasing its hydrogen content to make it more readily interchangeable with standard town gas.

A number of improvements in detail are described. The most significant is the addition of an electric heater for the incoming propane (air mixture replacing the usual gas torch to raise the temperature of the contact masse to reaction point).



Electric autothermic convertor

This arrangement has been patented by Gaz de France. Its object is to simplify starting up and to avoid the production of low quality gas during that period. It obviates the lengthy manipulations necessary in the use of the gas torch (opening the retort, applying the extractor, manipulation of the burners, dampers, purging). Operation is automatic. It consists of an electrical resistance element placed in the feed tube as shown. Current consumption is low. It is to be noted that a red heat is attained in about 10 minutes. In practice 15 minutes is sufficient for the mixture to ignite and for the alumina to attain the reaction temperature. Starting-up time is thus much reduced.

The authors confirm that the best results in the direction

desired are obtained with the activated alumina S17 in spite of its relative physical weakness shown by a tendency to crumble. For some time, the Ste. d'Ugine has been preparing activalum S17, variety gamma, activated at 700°C. Its specific surface is a little less but it contains a small quantity of soda which increases its cohesion.

INFLUENCE OF COKING ON CHARGING TIME

By P. Foch and R. Busso.

The plant available for the study of coking at Marienau consists of one battery of coke ovens of the normal type and one semi-industrial 400 kg. oven. The former consists of four ovens separated by three 'false ovens,' *i.e.*, empty compartments, permitting a certain independence of temperature of the different working ovens. These are of different widths: 250, 300, 380, and 450 mm. The ovens are normal in construction except that their length has been reduced by one half. The height of the charge is 3.80 m. Heating and operation are normal.

The tests showed that the time required for complete coking, charging time, is proportional to the density of the charge and to the width of the oven. It is practically constant over a range of humidity from 1% to 7%, but increases rapidly beyond that. It varies directly and very quickly with the temperature of the combustion chambers. These 'linear laws' are, of course, only approximations, sufficiently close only within the restricted variations of industrial practice.

It follows from these results that, as an increase in the density of the charge entails a proportional increase in the coking time, the daily production of the oven is not affected; that narrow ovens have a productivity greater than wide ones; that the width of the oven has very little effect on the quality of the coke; that there is no advantage in increasing the moisture content of the charge; (on the contrary, drying the charge improves notably the quality of the coke); that an increase in working temperature improves the productivity of the battery, but it can have a deleterious effect on the quality of the coke. In the discussion M. Jully expressed the view that the nature of the charge and the regularity of the temperature played an important part in the productivity of the oven.

CONSTRUCTION AND ARRANGEMENT OF GASWORKS

By Maurice Clapier.

The continuing evolution of the gas industry has placed at our disposal new technical devices in the electrical field and in mechanical handling which should lead us to revise our methods of construction. We must turn towards the reduction or suppression of buildings and the simplification of storage and handling, tending to reduction in production costs.

Installations in the open air are widely used in oil refineries which resemble gasworks to some extent. It is paradoxical to put up costly buildings and to place ourselves voluntarily in conditions most favourable to the danger of explosions when we can quite well erect most of the plant in the open.

M. Clapier stresses the danger of explosions. Much apparatus, exhausters, compressors, meters, *etc.*, has been placed in carefully closed buildings. Here there is always risk of leakage and therefore of explosion. Having thus *created the danger*, we have then sought to avoid accidents by stringent regulations leading to very costly constructions. Electrical installations have been executed in special materials and put to work with elaborate precautions. The author gave instances of recent installations which are 'very fine technical creations, but very costly.'

Several examples, illustrated by drawings and photographs, are given, in which much or all of the plant is erected in the open. Only the control apparatus is housed. This technique, however, demands certain precautions. Electrical and mechanical apparatus must be designed to withstand the weather. To avoid difficulties due to condensation or icing, apparatus must be provided with reheaters to ensure that the gas in circulation has a sufficient temperature whatever the weather conditions. Such reheaters are already recognized as indispensable to purifiers in the open. It will no doubt also be necessary at certain points to provide very careful insulation.

The second part of the paper is devoted to the handling and storage of coal and coke. The author's view is that improvements in electrical and mechanical apparatus are such as to increase their reliability to the point where it is not necessary to multiply measures of security. It is no longer indispensable to provide elaborate duplications. In particular, it is not necessary to provide big, costly storage bunkers over the gasmaking plant. Coal can be stored on the ground with small hoppers at the breaking and mixing point and a few hours storage at the end of the retort house, oven battery or other gas-making plant, provided that the handling plant is robust and immune from breakdown. Coke bunkers containing pre-screened or unscreened coke can be placed alongside and not above the final grading plant. The author favours, for the handling of coal, bulldozers, mechanical shovels or scrapers, rather than such costly apparatus as transporter cranes. He has tried to show that, profiting by all the technical appliances now available, we can envisage a profound modification in methods of construction, realizing substantial economies in first costs and thus effecting a substantial reduction in costs of gas manufacture.

GUM AND DUST TROUBLES IN FRANCE

By Edmond Mathieu

Gum and dust deposits in mains and services were the subject of two papers presented to this year's annual meeting of the Association Technique du Gaz en France. M. Edmond Mathieu discussed the subject generally and described in detail with drawings a type of filter which had proved satisfactory. It appeared that gums are formed only by the polymerization of the (non-saturated) diethylenic hydrocarbons which give rise to macromolecules in the presence of peroxide of nitrogen. 'All cracking operations, in general, give rise to non-saturated hydrocarbons. That is why gas produced by the cracks of fuel oils (Hall process) and in the production of carburetted water gas result in a mixture particularly favourable to the formation of gums.' Of several alternatives the filter chosen was a waterproof paper mounted on a sheet-iron frame. The paper discusses whether the filter should be placed at outlet works, on the distribution system or at the points of utilization; the prototype was actually placed at the entrance to a section of distribution. The filter is so fixed as to be readily removable from the line. Pressure gauges are fitted before and after; the loss of pressure indicates the accumulation of deposit in the filter and the time for changing it. The governor serving the district remained free from gum and there were no complaints from consumers under this heading during its use.

During the autumn of 1952 deposits of dust gave trouble for the first time in the Parisian distribution system. These were examined and reported upon by the M.M. Creusot and Tellier of the Central Control Laboratory. The dusts indicated two groups of facts essentially different; the action of the gas on the internal walls of mains, the presence of gums in the gas distributed. Collected in quantities of several kilograms the dusts in the mains appeared as scales and grains of rust containing 48% to 77% iron oxides (particularly the magnetic oxide) mixed with small quantities of oils, ammonium salts, Prussian blue, etc. An important part consists of débris of the initial scale on the metal, and the absence of purifying material and gums was noted. At the consumers' premises the gauze of central heating burners was obstructed by slight deposits, adherent and spongy, brown ochre in colour. Treated with acetone the colour disappeared and the residue of metallic débris more or less resembled rust with crystals of ammonium salts. The acetone extract on being heated revealed the presence of gums in very variable proportions.

Tests were then made on the gas sent out from works, for dust entrained by the gas and its content of oxides of nitrogen. From the point of emission to that of distribution dust content diminished, apparently by the soluble constituents of the dusts; but the nitrogenous oxide content of the soluble fraction increased, tending to render the dusts more troublesome. Nitrogenous oxides were observed definitely to decrease during the arrest of gas in the holders; eight hours made a noticeable difference. A similar fall was noted in the distribution system.

In the discussions it was urged that producers and distributors should collaborate in the solution of troubles arising from gums and other deposits. M. Delbourg was emphatic that protection against gums should not be added to the apparatus of utilization which was already sufficiently complicated.

The North Thames Non-domestic Load*

By N. R. JUNKISON, M.Inst.Gas E., M.Inst.F. ‡

If by Government pressure or sheer force of economic circumstances public spending power is considerably reduced, compelling the industrialist and the commercial company to cut costs in every possible direction, what is the strength of our position? It depends almost entirely on the extent to which we are in the forefront of development and have continued to provide a service which is worthy to maintain its important position in providing the nation's fuel requirements.

One of the Sunday newspapers with the larger headlines recently carried an article pointing out that in many thousands of generations' time the dying heat of our sun will no longer support the human race. Since the time taken to travel to a suitable planet in some other solar system would occupy perhaps over 100,000 generations at a speed of 50,000 miles per hour, arrangements for the journey must be put in hand in the not so distant future if our descendants are to survive. It is a pretty thought to wonder if a gas engineer will be included in the original party and how many gas engineers there will be when they arrive!

I intend to speak here, however, of a few of the more immediate problems in relation to the non-domestic gas load in the North Thames area, and to describe some of the steps we have taken or envisage to meet or anticipate circumstances. For such a general survey it is convenient to take the three main purposes for which gas is used in non-domestic premises: (1) Industrial process work; (2) catering; (3) space heating and hot water.

The Industrial Process Load

It was estimated in the Ridley Report that over the next ten years the demands for heat in industry, other than the iron and steel industry, would increase by 20%. During the last four years gas used for manufacturing purposes in the Board's area has increased from 57.3 mill. therms to 67.8 mill. therms per annum. The load is spread among a great variety of manufacturers and, by virtue of its independence of any one section of industry, may be considered relatively stable. More than 45% of the annual consumption is taken during the two summer quarters.

During the last four years nearly 400 new factories have been built, but about 80% of them are less than 10,000 sq. ft. in area, and many of them in reception areas which house those industries moved from the inner Metropolitan Boroughs. Because of the geographical shape of our area, many firms which move find their new sites in adjoining Boards' areas. It can be said therefore that the increase in load has occurred, not so much as a result of the building up of new additional industrial estates and the growth of industry in the area, but rather from the development of new gas loads in existing premises and from increase in production. While this increase in gas consumption may in itself be considered satisfactory it is necessary to measure it against some known background before a more critical assessment of the results so far attained can be made.

Last month Mr. A. E. Tyrrell at the Gas Sales and Service Conference read a paper entitled 'An Industrial Selling Plan at Work,' in which he showed the relationship which can be detected between industrial gas sales and the Index of Industrial Production. Mr. Tyrrell said that the demand for industrial gas has for many years shown an almost uninterrupted upward trend not always related to industrial production. This seemed to suggest a condition in which we were still finding greater uses for gas in factories, and also that we are now approaching the stage at which the industrial gas demand curves and the industrial production curve may follow a similar pattern. Since then we have been trying to see more clearly what the relationship is and the extent to which we may be improving our position. It is not sufficient to judge the success of industrial gas sales merely by the trend of actual increases in the number of therms sold, any more than it would be to attempt to appraise the space heating load without regard to variations in mean temperature.

It would be foolish, however, to try to draw too precise deductions from these figures: in our present state of knowledge they can only be used as an indication of what we should expect. Many questions spring to one's mind. Can we reasonably expect that, for instance, a 10% increase in production should require a 10% increase in gas consumption? Is the index of production a true figure for the industries within the area? Ought we not to relate the figures to the total heat requirements of industry? Without further information we cannot answer these questions. We cannot detect if in any particular sections of industry we may not be getting our expected share of increased potential, nor can we tell if the overall figures are unduly affected by a variation in one section which is not representative of the whole.

For these and other reasons arrangements have now been made to tabulate all gas sold to industrial premises in the Board's area quarter by quarter under each of the 163 headings in the industrial classification. The figures then obtained will give us a much more precise assessment of our progress and enable us to determine what are the components of the general picture.

Measured against the organization of the oil industry, and the huge resources of the electrical engineering industry, at present looking mostly to export and heavy engineering projects, our sales force is limited. It behoves us to take the greatest care that it is led in the direction where it is most needed, or where the ground is most fertile.

Modern production techniques are leading to demands for heat which can only be met by a refined fuel, but gas has two principal rivals where heat is required for process work—oil and electricity. The developments in oil burners, allowing heat release in smaller quantities under reasonably controlled conditions and increased reliability of automatic control, constitute a threat on the one hand, while on the other we are faced with the high thermal efficiency of the application of electricity, coupled with its amenity value. A study of the comparative costs of various fuels on the basis of therms usefully employed makes it clear that in many directions gas cannot be sold for industrial purposes on price alone, as has been possible in many instances in the past. This need not cause us dismay for a very large part of our load has for many years had to compete with cheaper fuels. It does, however, point urgently to the need for a more definite conception of industrial gas as a service rather than a fuel. We must pay particular attention to the training of staff if they are not to be discouraged by conditions which may, for lack of more intimate knowledge, seem to them wholly unfavourable. There will be greater need in the future for the visiting industrial engineer to have wide knowledge and appreciation, not only of the technical problems in connection with specific applications of gas to heat processes, but of the economics of the industry with which he is dealing and the production problems facing the management.

The Catering Load

For all major catering operations the popularity of gas has continued to increase. It was at one time thought by some that the end of food shortages and the ability of the housewife to buy a variety of supplies would lead to a decrease in the fuel consumption for commercial catering. This has not, however, been the case, since other factors have had an overriding influence. Among the principal of these I would mention the incidence of full employment, the continuation of the acquired habit of taking meals away from home, difficulties in obtaining domestic help, and the extension of paid holidays leading to a greater number of visitors. Furthermore, there has been a remarkable increase in the

* From the Presidential Address to the London and Southern Junior Gas Association, in London, October 14, 1955.

‡ Headquarters Division, North Thames Gas Board.

number of foreign visitors to this country, most of whom spend at least part of their stay in London.

At the same time, increasing prices and the wider choice of foods available have made it necessary for caterers to lengthen their menus, tending to increase the fuel consumption per meal served. The figures for gas sold on catering block rate over the past four years in the Board's area demonstrate the effect of these influences.

Year ended March, 1952	...	33.5 mill. therms
Year ended March, 1953	...	35.2 mill. therms
Year ended March, 1954	...	35.5 mill. therms
Year ended March, 1955	...	36.6 mill. therms

During the past four years we have replaced 63 electric ranges on the score either of lower running costs or improved service, or both. However, the manufacturers of heavy duty electrical catering equipment, anxious to expand their market, are urging the electricity boards to adopt a more progressive attitude.

Oil cannot be considered a serious competitor in this market, and although coal is still used as well as gas in some of the better known hotels and restaurants, this is usually because of a personal desire to continue traditional methods. Frequently a change of chef provides the opportunity to effect a change in fuel, and during the last twelve months we have had a number of successful installations carried out at this time.

The need to provide better standards of hygiene and better working conditions for kitchen staff, is giving us the opportunities to replace old equipment. The specialist representatives carry on a continuous campaign to this end among the long-established premises.

For some years after the war the demand for new catering appliances, for the re-equipment of old, and the establishment of new restaurants, far outstripped the supply, and there was little time or opportunity for most of the appliance manufacturers to design new equipment. They were indeed fully occupied with production problems to fulfil orders in hand. It is a good thing in regard to the future security of the gas load that circumstances are changing and that this is again a competitive market.

A development which played an important part in the earlier stages of the campaign to replace solid fuel and older equipment, was the introduction of the solid type of hotplate, which is now widely used in the larger kitchens. Recent investigations point to the need for further development work. It may be possible to increase the heat input and surface temperatures, and thus raise the duty, beyond what has hitherto been practicable without the use of air blast or high pressure gas. Since so much of the cooking load, some 95%, is already in our hands, we cannot expect any spectacular increase. The problem is rather to consolidate the existing load by the installation of modern equipment at every opportunity and to ensure that we take advantage of any trend in the industry which can react in our favour.

In recent times there have been changes within the catering industry itself which are changing the nature of the load. With greatly increased labour costs and overheads, one of the caterer's principal problems has been to keep down the cost of the meal served to a sum not incompatible with the value of the food consumed.

In 1937 and 1939 there were attempts to introduce self-service cafeterias, but these were not acceptable to the general public. During the war the shortage of staff and the need for bulk feeding enabled this system to be brought to a high pitch of efficiency in industrial and office canteens, and once having become accustomed to the slight inconvenience, the worker appreciated the advantage of the speed of service obtained and the opportunity to choose the food by actual inspection. The principle has since been widely extended in the lower-priced range of catering establishments for the public.

More recently the practice of cooking a restricted range of dishes in view of the customers is extending to the medium-priced restaurant, as a result partly of experience of counter service and partly of the influence of American practice. Thus we find a well-known West-End restaurant opening an attractively fitted section solely for the service of bacon and egg in this way and reporting a phenomenal increase in turnover.

This development calls for a range of equipment which is new in this country, such as griddle plates, frying and boiling plates, designed to fit into the run-of-counter equipment. While gas can show an economy in running cost over electricity, this advantage must be accompanied by simplicity of design and reliability in use. An attractive appearance and good finish which will not deteriorate in use are equally important.

Space Heating and Hot Water

The use of gas for central heating and hot water since the war in the area served by the Board has increased by nearly 500% and the year's consumption at the end of the last heating season reached 21½ mill. therms, slightly more than two-thirds of this being supplied to commercial premises. Although the price of gas has risen in relation to the price of oil and the technique of application of oil to boiler plants has improved, we are continuing to make progress in increasing the load.

It has been claimed that oil possesses all the advantages of gas from the point of view of automatic control and saving in labour costs. But oil burners require regular and fairly frequent attention if smoke emission is to be avoided and fully automatic operation can be applied to gas boilers with less complication, and therefore greater reliability, than is the case with oil. Furthermore, the troubles to be encountered in flues from oil-fired boilers operating at high efficiency are likely to be serious. It seems clear, however, that at present prices the use of gas will generally be confined to the smaller installations under, say, 1 mill. B.Th.U. per hour input, and even in this size of installation, particularly to situations where space is at a premium and labour would otherwise have to be found specially for boiler attendance.

A survey of the results we have obtained in the City of London bears out this premise. We estimated that in the square mile of the City about 800,000 therms of gas per annum were used for central heating and hot water before the war. Nearly two-thirds of the total floor area in commercial premises was destroyed during the war, but by September of last year the consumption of gas for central heating and hot water had risen to 1,800,000 therms per annum.

The total heat requirements for space heating in the rebuilt part of the City will be some 11½ mill. therms per annum, and if we were able to obtain only 7% of the load this would represent an additional gas consumption of more than 1 mill. therms per annum. Our policy for promoting the expansion of the load rests on the foundation of the closest possible liaison with the heating trade by our specialist representatives. They are able to calculate running costs, give comparative costs, and evaluate the competitive position after allowing for saving of space, labour, capital cost of flues, and any special circumstances applicable to the particular installation. This is especially valuable in the case of the smaller installations, where our greatest opportunity lies, since these are often carried out by the smaller firms who seek our advice in the early stages. These representatives deal also with central heating and hot water installations in domestic premises.

Whereas the comparative basic fuel costs of gas and domestic fuel oil stand now in the proportion of 2:1, in the case of a 500,000 B.Th.U. plant, it is possible by careful setting of thermostats and judicious use of clock control to reduce the difference in actual running cost to a figure which can be offset by savings in other directions. Due principally to technical difficulties in flueing, I do not consider we can expect to effect any significant saving by increased thermal efficiency in the conventional gas boiler. It may be, however, that with any further rise in fuel costs generally, a point will be reached where it would be economical to employ a specially designed boiler with induced draught for the sake of the extra few points in efficiency which might be attained.

Where competition is such that it is necessary to avoid the capital cost of a new boiler there is a good case for gas in the conversion of solid fuel cast iron sectional boilers. Fifty such conversions were carried out during the past twelve months, and by careful design of a simple conversion, thermal efficiencies comparable with those of standard purpose-made boilers have been obtained. Hitherto these conversions have been individually designed and I suggest there is room for further experiment and the development of a standard technique which will permit the results so far obtained to be reproduced with confidence. I see no reason why, providing the competitive position remains substantially unchanged, we should not continue to increase the load for central heating and hot water, at least for some years, at the rate of nearly 2 mill. therms per annum.

Flueless gas appliances have for many years provided a simple and economical means of heating commercial premises, both from the point of view of running and installation costs. Over the last 25 years considerable progress has been made in their design. , Free-standing appliances of less thermal capacity and giving more directional heat have been developed, thus providing quicker and more effective heating-up and greater flexibility of control.

A notable contribution has been made to the space heating load by the introduction of the overhead radiant heater which is particularly useful in small factories and workshops with sufficient headroom. I recall Mr. D. R. Wills' recent paper to this Association which gave such valuable information for the planning of such installations—also the good work he has done in putting the case for their proper use in places of worship. Incidentally, we now have 325 installations of gas heating in churches and church halls in the North Thames area. There are many commercial premises where individual gas appliances provide the solution to the space heating problem, and North Thames has recently introduced a two-part tariff which should do much to encourage this load, since hitherto we have had no appropriate tariff providing a reduction on the flat rate price except for relatively large consumers.

The Shops Act requires that sufficient ventilation and a reasonable temperature shall be maintained in the premises. In the past many shops have been provided with quite inadequate heating, often in the form of a few flueless heaters. Modern shop designs, the presence of some dyed materials, and other considerations frequently preclude the provision of the requisite heating standards by these means. Site conditions, and expense, may make central heating an impracticable proposition. Unless some action be taken we may easily lose the existing space heating. With this situation in mind we have studied a number of ways of providing economical installations. One of the more effective methods, particularly where the area is split up by partitions or cubicles, is by the use of air heaters, using a modicum of forced convection. The heaters can frequently be accommodated behind the back wall of the shop premises and the warm air introduced by a short length of ducting. The system can be used in conjunction with other appliances and is equally appropriate for office premises. It lends itself to automatic control.

Institution Autumn Research Meeting Programme

The 21st Autumn Research Meeting of the Institution of Gas Engineers will be held at Church House, Westminster, S.W.1, on Tuesday and Wednesday, November 22 and 23, under the Presidency of Mr. W. K. Hutchison, C.B.E., M.Inst.GasE., M.I.Chem.E. The following programme has been arranged:—

Tuesday, November 22

9.30 a.m.; Opening. Presentation and discussion of the 16th Report of the Chairmen's Technical Committee: 1954-55. (*Comm. No.* 472.)

10 a.m.; Presentation without discussion of 'Recommendations to Prevent Accidents during the Cutting Out of Gas Mains for Repairs and Alterations (For use with cast iron and steel mains with pressures not exceeding 50 lb. per sq. in.).' (*Comm. No.* 473.) Presentation without discussion of the Institution Gas Research Fellowship Report: 1953-54. (*Comm. No.* 474.) Presentation and discussion of the 32nd Report of the Gas Education Committee: 1954-55. (*Comm. No.* 475.)

10.50 a.m.; Presentation of Diplomas and Prizes.

11 a.m. to 12.20 p.m.; Presentation and discussion of Symposium on Coke. (*Comm. No.* 476.)

I 'Coke in the Domestic Market,' by H. F. H. Jones, Deputy Chairman, Gas Council.

II 'Factors Affecting Coke Availability in Gas Manufacture,' by J. Burns, Chief Engineer, N.T.G.B.

III 'Production of Open-fire Coke from High-rank Coal,' by J. E. Davis, Chief Technical Officer, S.E.G.B.

IV 'The Application of the Carrier Gas Process to the Production of Solid Smokeless Fuel,' by W. Hodkinson, Chief Technical and Planning Officer, N.W.G.B.

V 'The Carbonization of Low-rank Coals in Continuous Vertical Retorts,' by W. R. Branson (Deputy Chairman), and E. T. Pickering (Chief Chemist), W.M.G.B.

VI 'Coke Quality and Appliance Performance,' by F. J. Eaton (Deputy Manager, Watson House), and F. A. Burden (Coke Laboratory), N.T.G.B.

ASSEMBLY HALL

2.45 p.m. to 3.30 p.m.; Presentation and discussion of paper, 'A Comparison of Fuels for Cooking,' by E. W. B. Dunning, Chemist, N.T.G.B. (*Research Comm. GC*22.)

3.30 p.m. to 4.15 p.m.; Presentation and discussion of paper, 'The Tolerance of Aerated Burner Appliances to Variations in the Combustion Characteristics of Town Gas,' by G. H. Fuidge (Chief Physicist), and J. R. Dewhurst (Senior Physical Chemist), S.E.G.B. (*Comm. No.* 477.)

4.15 p.m. to 5 p.m.; Presentation and discussion of paper, 'An Investigation of Explosion Reliefs for Industrial Drying Ovens. I—Reliefs in the top of Box Ovens,' by P. A. Cubbage, and W. A. Simmonds, Midlands Research Station, Gas Council. (*Research Comm. GC*23.)

HOARE MEMORIAL HALL

2.45 p.m. to 3 p.m.; Presentation without discussion of paper, 'An Investigation into the Composition of Ammoniacal Liquor. I (continued).—Continuous Vertical Retort Liquor,' by W. H. Blackburn, L. Barker, J. R. Catchpole, and N. W. Hollingworth (University of Leeds). (*Research Comm. GC*24.)

3 p.m. to 4 p.m.; Presentation and discussion of paper, 'The Treatment of Gas Works Liquor in Admixture with Sewage in Percolating Filters,' by W. H. Blackburn (University of Leeds), and T. G. Tomlinson, and H. Hall (Water Pollution Research Laboratory, Department of Scientific and Industrial Research). (*Research Comm. GC*25.)

4 p.m. to 5 p.m.; Presentation and discussion of paper, 'The Bacterial Oxidation of Gas Liquor,' by E. H. M. Badger, London Research Station, Gas Council. (*Research Comm. GC*26.)

Wednesday, November 23

10 a.m. to 11.15 a.m.; Presentation and discussion of paper, 'Area Technical Services,' by J. E. Davis, Chief Technical Officer, S.E.G.B. (*Comm. No.* 478.)

11.15 a.m. to 12.30 p.m.; Presentation and discussion of paper, 'Some Aspects of Research in the Petroleum Industry,' by W. M. Catchpole, Chief Research Chemist, British Petroleum Company. (*Comm. No.* 479.)

2.30 p.m.; Presentation without discussion of paper, 'An Examination of the Measurement of Radiant Energy,' by P. W. R. Morpurgo (*Research Comm. GC*28.)

2.35 p.m. to 3.30 p.m.; Presentation and discussion of the 46th Report of the Joint Refractories Committee: 1954-55. (*Research Comm. GC*27.)

3.30 p.m. to 4.30 p.m.; Presentation and discussion of paper, 'The Internal Structure of Flame Reaction Zones,' by G. Dixon-Lewis (University of Leeds). (*Research Comm. GC*29.)

4.30 p.m. to 5 p.m.; Concluding Business of Meeting.

A large extension for plant manufacture is now being built by the British Oxygen Engineering Co. at Edmonton. The new plant department workshops have become necessary as a result of the continuous increase in the sales of plant and equipment for use both in this country and overseas. The building will be completed by next January and will be occupied in April. It has been designed by B.O.E.'s own staff of architects and civil engineers, who are also supervising its construction.

SMOKE PREVENTION*

By Arnold Marsh, O.B.E. †

A WEAKNESS of the Clean Air Bill is that emphasis is put on the abatement of smoke, rather than on its prevention. That is to say, emphasis remains on action to be taken after smoke has been emitted, and its emission has been observed. Control based on observations of smoke emissions ceases after dark, and no one knows to what extent No. 2 Ringelmann may be turned into No. 1 by the reprehensible and heat-wasting practice of diluting it with excess air. It is not suggested that this form of control is not necessary, but it is suggested that prevention should be strengthened. Prior approval of plant should be made obligatory, and not at the users' option; there should be some supervision of maintenance; and there should be at least a start towards requiring the employment of trained and certificated boilermen.

The danger of making criticisms of detail, in this way, is that the impression may be created that the Bill is generally unsatisfactory. This is certainly not my intention, for on the whole it is a most valuable means for progress, and despite certain faults of omission and commission it is perhaps nearly as good as we can expect at the present stage of public opinion. But it must be regarded, not as the final bridge, but as a stepping stone towards clean air. It is by no means the last Clean Air Bill we shall need.

We do not, of course, know how much the Bill will be amended as it goes through Parliament, and for that reason it is difficult to talk with any precision about the problems of the new phase. Two, however, do stand out as certainties. First there is the very material and practical problem of the provision of smokeless fuels for the smokeless zones and control areas, and secondly there is that of the education and propaganda necessary to create—for it exists so far only in a rudimentary form—public opinion ready to accept the changes that are to come.

The Smokeless Fuels Problem

On the problem of supplying smokeless fuels, adequate in both quantity and quality, it is difficult to add to the admirable analyses made by Dr. G. E. Foxwell in his appendix to the Beaver Report, or more recently in a paper read in Glasgow and reprinted in the summer, 1955, issue of *Smokeless Air*, and in a paper at the Bournemouth conference.

The problem may be summarized very briefly. Since domestic smoke is responsible for nearly one half of the pollution from which we suffer, it must be effectively dealt with in any worthwhile clean air drive. The smoke is due to burning bituminous coal in traditional appliances, and its prevention must depend on a large-scale change-over from these to smokeless methods. Although it would be ideal if the change could be made by going over entirely to gas and electricity, supplemented to a perhaps increasing degree by oil (including paraffin), it is generally agreed that we are forced to continue to depend, to a very large extent, upon the continued use of solid fuel. The reason for this is that only with solid fuel can the heavy winter load, including the excessive peaks experienced during very cold spells, be satisfactorily and economically met. Over the course of years the pattern may change—the use of solid fuel in our homes must come to an end some day—but for the immediate future we must continue to rely to a large extent on the use of solid fuel for the main winter space-heating load, although at the same time the use of gas and electricity must be encouraged.

It is therefore to smokeless solid fuel that we must look—or possibly to some extent to the use of bituminous coal in special appliances that will enable it to be burned smokelessly, or virtually so. For new houses, using warm air or other central heating methods, a furnace already exists by which this can be done, but for the near future such appliances can have only a marginal effect.

To get rid of domestic smoke therefore means discontinuing the use of 36 mill. tons of coal a year. The amounts of smokeless fuel at present available, in million tons, are as follows:—

Anthracite	2.8
Dry steam coal	4.1
Coke	26.1
Other carbonized fuels	6.2
Total	39.2

Of this, only a little more than 3.5 mill. tons is at present being used for domestic purposes. Only a small proportion of the remainder can be diverted from industry—nearly half the coke production, for instance, is made for and used by the iron and steel industry—and Dr. Foxwell estimates that over the next few years about 1½ mill. tons can be diverted from industry to domestic use. He also estimates that the production of smokeless fuel for domestic purposes over the next three years could be 2.3 mill. tons, giving a total new availability of 3.7 mill. tons.

In the face of such figures—3.7 versus 36—the chances of successful domestic smoke prevention would seem to be pretty slim. It is this situation that led the Society to promulgate the idea of smokeless zones, and the Beaver Committee to recommend that attention should be concentrated on the black areas only. If we do this, and ignore for the time being the smaller towns and country districts, where air pollution is less menacing, then we are faced with a load of 19 instead of 35 mill. tons.

The argument—very much condensed—now runs as follows: 16 cwt. of smokeless fuel, in improved appliances, will do the work of one ton of coal. The 19 mill. tons of coal therefore need 15.2 mill. tons of smokeless fuel to replace them. As seen, 3.7 mill. tons of this can be quickly made available, leaving a deficiency of 11.4 mill. tons, which—converting back again on the efficiency basis—is equivalent to 13.8 mill. tons of house coal. A continuation of present trends towards greater use of electricity, plus a further switch of gas coke to the domestic market, is estimated to leave 10 mill. tons of coal to be replaced by 8.5 mill. tons of smokeless fuel. This is by no means an impossible task. It can be done mainly by increasing carbonization capacity at the gasworks and coke ovens, and by increasing production from low temperature carbonization processes, together with, possibly, new types of smokeless fuel from processes now being sought for by the National Coal Board. If this development can be achieved, by stages, over the next ten to fifteen years, then by that time, also by stages, the black areas can in their entirety become smokeless zones and smoke control areas.

Future Work

The tasks facing the Society in the near future can be regarded as falling into two categories:—

(a) The general campaign to create public awareness and understanding of the problem, so that action under the Act, and such matters as, for example, the development of a favourable fuel and power policy, will be encouraged and supported by public opinion. We cannot go too far ahead of public opinion, and despite all the advance of recent years this has still a very long way to go.

(b) The special campaigns to prepare the way for smokeless zones and smoke control areas. Here the general campaign has to be concentrated, made more personal, and directed into the homes of those who will be affected by the change.

The local authorities must recognize that if they are going to make a success of the new Act they must be prepared to pay for it. Apart from the non-recurring cost of conversions in smokeless zones, they must be prepared to make annual payments to cover: (1) Adequate (and often increased) staff on a good salary scale. (2) Measurements of pollution and any other necessary investigations or surveys in their area. (3) Educational and publicity material and services, as permitted under the Act.

* From a paper read to the Annual Conference of the Scottish Division of the National Smoke Abatement Society, at Ayr on October 21, 1955.

† Director of the National Smoke Abatement Society.

DE
DEMPSTER · ELLAND

1855-1955
100 YEARS
in the service of
The Gas Industry

COMBINED OXIDE HANDLING PLANT
and Cover Lifting Apparatus
for Overhead Purifiers

Introduced into this country by us, the oxide handling equipment illustrated above has been widely adopted, and we have erected more plants than all other makers combined.

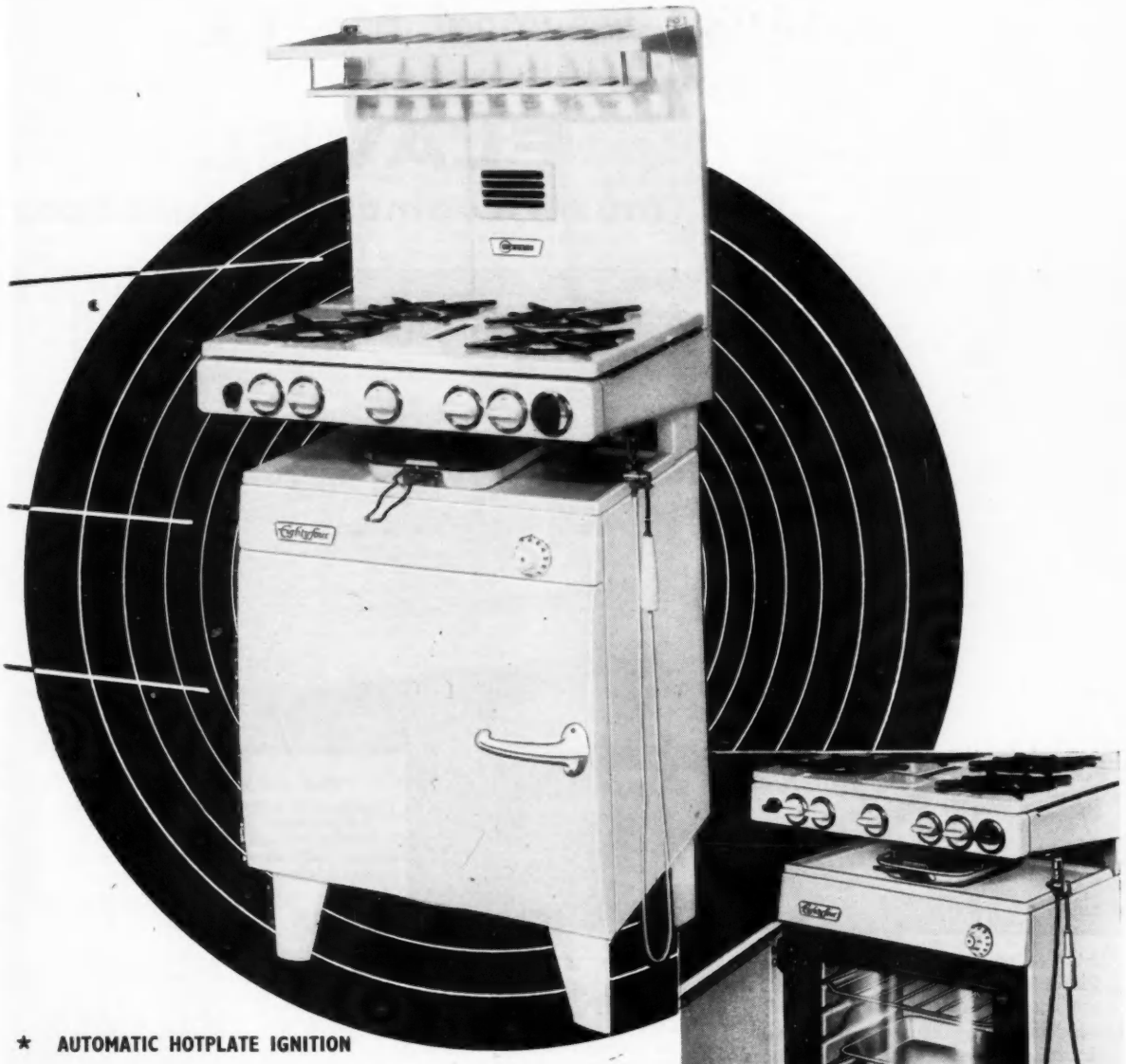
ROBERT DEMPSTER & SONS LTD
ELLAND YORKSHIRE
LONDON OFFICE: 57 TUFTON STREET, WESTMINSTER S.W.I.

Something— to shout— about!—

Here's a cooker to bring the housewife into your Showrooms—something really new to publicise, to demonstrate and to sell.

The **NEW WORLD** Eighty Four G, a De Luxe model, is now available in addition to the current Eighty Four.

DEMONSTRATE ON THE EIGHTY FOUR G



- ★ AUTOMATIC HOTPLATE IGNITION
- ★ FINE-CONTROL TAPS WITH NEW SAFETY FEATURES
- ★ PUSH-BUTTON OPERATED INNER GLASS OVEN DOOR
- ★ IMPROVED PAN SUPPORTS AND GRILL PAN HANDLE
- ★ POLISHED BURNER LEADS AND OVEN GRID SHELVES
- ★ EASY TO CLEAN OVEN SIDES
- ★ GAS TAPER
- ★ MANY OTHER DETAIL IMPROVEMENTS

SEEING IS BELIEVING!

SELL NEW WORLD PRODUCT OF Radiation Ltd

RADIATION GROUP SALES LTD., 7 STRATFORD PLACE LONDON, W.1. TEL: MAYFAIR 6462

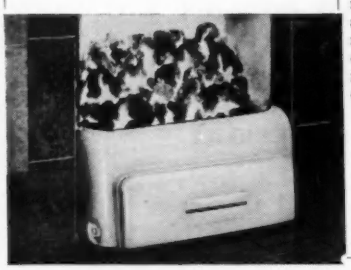
They'll expect FLAVEL modern domestic appliances

The FLAVEL 'Seymour'
Controls for slow or fast burning. Gleaming vitreous enamel in a choice of 5 beautiful colours. Gas ignition available. Burns any solid fuel—best on smokeless. Can be used with or without back boiler.

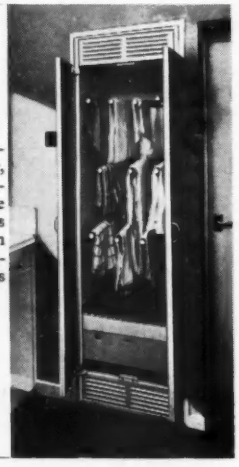
It's not surprising that people expect Flavel Appliances. Architects throughout the country are specifying them . . Builders in their thousands are installing them. And Flavel is impressing the public through nation-wide advertising on the merits of good design and economic upkeep of their new range of gas and solid fuel appliances. Approved by the Ministry of Fuel & Power, they are being sold in huge quantities to Municipal Authorities and Housing Development Projects.

There's no doubt about the reasons . . . the contemporary styling and beautiful colours of Flavel Appliances blend with any decor, they are moderately priced and economically maintained. That's what people look for, be it a solid fuel grate or a gas heated clothes dryer.

The 'Newbold'
Slow or fast burning control. Can be used with or without back boiler. Gas ignition available. Vitreous enamel finish in a range of 8 beautiful colours. Burns any solid fuel—best on smokeless.



The FLAVEL Clothes Dryer
Gas heated and available as freestanding, built-in, or semi-built-in. Suitable for the average family, it is made of cream enamelled steel. Specifications and prices on request.



No other appliances can compete for fine appearance and thrifty upkeep!

See a FLAVEL first

SIDNEY FLAVEL & CO. LTD., LEAMINGTON SPA · Telephone: 100 (Head Office) 3091 (Sales Office) · Telegrams: FLAVELS

F.E.I. and Increased Efficiency*

By J. C. Macdonald, Assoc.M.Inst.Gas E.

THE accent on increased efficiency is not new but has probably become more pronounced in recent years. In the group to which I am attached the policy ever since vesting date has been progressively to increase operational efficiency and to give technical assistance to the smaller undertakings. Working results have been considered on a group basis, and large numbers of chemical tests have been carried out from time to time in all the works in the group, particular attention being given to C.V. of gas distributed. Sigma recorders have been fitted in all works within the group, and these tested and corrected regularly. The material control system recently introduced allowed more time to be spent on the smaller undertakings and permitted a clearer idea to be formed of the possibilities of the various works. While the policy within the group is to close down the smaller works and to extend bulk supplies wherever possible, it is recognized that substantial savings can be made if attention is given to the working of these retort houses. The material control system, as is well known, uses the Fuel Expenditure Index (F.E.I.) to gauge working results, and while F.E.I. has many disadvantages when used for this purpose, it is nevertheless the only single expression which has been devised and which can be used for works of any size. It may be that in future a better expression may be found on which to operate a control of materials used in the process, but in the meantime F.E.I. should be treated with caution and always read in conjunction with cost per 100 therms. Doubts are often expressed as to whether it does not pay to make a large coke yield for sale with a lower gas yield as the best means of reducing F.E.I. It is very often a simple matter to reduce heats, reduce producer fuel, and have a high coke saleable figure, and indeed some of the best F.E.I. figures on horizontal works are obtained by this means.

Comparison of F.E.I.

On a horizontal retort bench a gas yield of only 50 therms, with 10 cwt. of saleable coke per ton of coal carbonized, will give an F.E.I. of 32, and to increase the gas yield to 60 therms, the extra producer fuel used might easily reduce the coke yield to 8.5 cwt. per ton of coal carbonized, increasing the F.E.I. to 35. In other words, a therm of gas counts the same as a therm of coke, or an increase in saleable coke of 1 cwt. per ton of coal carbonized has the same effect on F.E.I. as an increase of 13.45 therms of gas per ton of coal carbonized, each reducing F.E.I. by 4.5, and how often, particularly in small horizontal works, is it not easier to save 1 cwt. of coke than to increase the gas yield by 13.45 therms? When we consider cost, however, if the material cost of the gas is 960d. per 100 therms, or 9.6d. per therm, then the 13.45 therms is equivalent to 129 pence, or 10s. 9d., while the cwt. of coke is worth only about 4s. 4d. In the case I have quoted above the value of the extra 10 therms of gas per ton of coal will be 96d., while the value of the extra coke used would be 1.5 by 4s. 4d. = 78d., giving a saving of 18d. per ton of coal carbonized, or a saving, in effect, of 34d. per 100 therms of gas, while the F.E.I. has increased from 31.9 to 35.3. In other words, there is no doubt that in this case it pays to make the extra gas, rather than the extra coke, and the F.E.I. is quite misleading.

The use of F.E.I. as a method of comparison between undertakings rather tends to make us forget that coals differ. During the recent rail strike one of the works in the Perth Group used a large proportion of coal which is not normally considered to be suitable for carbonizing, plentiful supplies being available near the works. Carriage charges were consequently low, and the lower coal price enabled that coal to be brought into the works at about 15s. per ton less than the Fife coals normally used. While it was not possible to measure accurately the yields of products, it appeared that the loss of gas was 5 therms per ton as compared with the yields from Fife coals. A works carbonizing a coal costing 15s. per ton less than their normal run of coals could afford a gas yield of 5 therms per ton less than normally achieved, and 2¼ cwt. of coke plus breeze saleable per ton of coal carbonized less than normally expected, and still produce gas at the same material cost per 100 therms. The F.E.I. fluctuates from 18.3 with 90s. coal to 30.1 with the 75s. coal, giving an impression favourable to the better coal, while in actual fact the material cost of gas has remained unchanged. The picture would, of course, be altered somewhat if accurate calorific values were used for coal and coke.

Vertical Retorts

In controlling production in works using vertical retorts continuous supervision of the process is essential, and even in the small vertical retort plants (100 mill. cu.ft. per annum) a full-time technical assistant, doing nothing but controlling the carbonizing plant, could pay his way. A works of this size would carbonize about 5,500 tons of coal per annum, with a fuel figure of possibly 5 cwt. per ton of coal carbonized (F.E.I. 28). A fuel saving of 1 cwt. per ton of coal carbonized would give an annual saving of 275 tons of coke, worth over £1,000, or to put it another way, for an increase of 1 therm per ton in gas yield the coal saving would be 70 tons, worth, say, £315. For larger works the savings are in direct proportion. The proper control of a vertical retort plant consists of working the plant at maximum possible throughput, attending to the heating system so as to eliminate fuel wastage, and controlling pressure conditions on the retorts so as to avoid dilution with inerts. There is nothing particularly difficult about the job, nor does it require a high standard of academic achievement by the operator, but it does require his conscientious application to the task, continuous attention to details, an intimate knowledge of the setting, an understanding of the basic principles involved, and a willingness to get his hands and face dirty. On any setting I have yet seen I can safely say that where results have not been up to standard it has been because one or more of the above requirements has not been met.

There is a maximum throughput beyond which it is not possible to work; that is the stage at which heat cannot penetrate the retort walls quickly enough to carbonize the charge, and this stage is easily enough recognized as the coke is discharged. It is important to have a knowledge each day of what each retort is doing, and there are several methods of measuring daily throughputs. Hoppers can be calibrated, and with some perseverance it is possible to work out daily coal usage figures. Individual retorts can be checked on by watching the number of skips discharged, or by counting the bucketfuls of coke on the conveyor. Working to maximum throughputs means, of course, a carefully planned programme of lighting up settings at the proper time, and a planned scurfing routine, so as to avoid having retorts standing idle. A check should be kept on the volatile matter present in the coke, since this is the only test which indicates the completeness of carbonization. Attention to the heating system starts with attention to the producer, and here is the piece of plant which is so often neglected, yet which will give such a high return for any amount of energy spent on it. We should never dream of attempting to operate a gas cooker in a kitchen without a constant pressure of constant quality gas, and so in the same way must we ensure as constant as possible quality and pressure conditions of gas from the setting producers. The mechanical producer assists greatly in achieving better producer gas conditions, but as yet most of the settings we come across use step-grate producers, where the recovery rate after cleaning the fire is about 2½ hours, so that if the producer is cleaned twice per day it is making producer gas of good quality—CO_2 under 4%—for about 19 hours per day, and is recovering —CO_2 12% down to 4%—for the remaining five hours. If, as sometimes happens, the producer is cleaned three times per day, the good working period is about 16 hours, and the recovery period eight hours. The advantages of having only one clean per 24 hours are obvious, and I think that this is sufficient for producers which are properly worked, provided they are of adequate size. In order to determine the maximum period of time the producer can work between cleaning a CO_2 recorder is invaluable, and I think every works

* From the Presidential address to the Scottish Junior Gas Association (Eastern District), October 8, 1955.

should have one available. These have been criticized as being cumbersome and inaccurate, but I have found that with proper maintenance the self-contained absorption type of instrument, mounted on a stand so as to be portable, is fairly accurate and reliable. The producer should, of course, be operated at the maximum possible temperature permitted by the tendency to form clinker, since the CO/CO_2 ratio in producer gas depends upon the temperature at which the reaction takes place, the higher the temperature the higher the CO/CO_2 ratio. After working a producer for some time it is possible to determine the blast saturation at which clinker just begins to form. The volume of producer gas made depends on the amount of air/steam supplied below the grate for the reaction, and this is normally adjusted to maintain the necessary pressure of a few hundredths of an inch W.G. in the producer gas uptakes or common flue. The cleaning of the fire is an operation which requires supervision and should be carried out by the best labour available. It is necessary to clean in the correct sequence, which is: (1) Remove the ash from the bottom of the producer; (2) use the long poker to break up and loosen any clinker and allow the clinker to work its way down in the fire; (3) rake the steps, tending to underdo this, rather than to overdo it; (4) blind up the top step, or steps, with ashes; (5) clean up.

Analysis of ash removed from step-grate producers shows about 30% of carbon, which can be considerably higher when large amounts of unburnt fuel are removed with the ash. After giving all this attention to our producers and achieving a constant supply of good quality producer gas for the setting, there is little else to do to control the setting other than routine inspection of temperatures. A regular cleaning schedule is essential in order to prevent deposited dust from fusing, in which state it is practically impossible to remove. It is not necessary to play around with air slides or to adjust nostrils, nor is it advisable. Once the setting has been adjusted most variations originate in the producer. A check should be kept on the CO_2 content of waste gases at setting outlets and at the waste heat boiler inlet, so as to ensure efficient combustion conditions in the setting and to avoid air inleakage, which can seriously affect the evaporation in the waste heat boiler.

The control of pressure conditions in the retorts is a precept which is widely preached in text books, the exhortation invariably being to keep level gauge conditions at the offtakes. In many cases the retort house governor is used as a calorific value controller, and this is bad practice in all cases. The correct method of calorific value control in continuous vertical retorts is to vary the percentage steaming of the charge. When steam is increased to the retorts an alteration in the retort house governor setting is usually required in order to maintain the pressure conditions at the retort offtakes. It is preferable to work with a slight but definite pressure on the retorts, in which case there is no possibility of air being drawn in through the top ironwork, any leaks tending rather to blow gas, in which state they are easily noticed and can be given the attention they deserve. It is also advisable to have a system of carrying out crude gas analysis from individual retorts at regular intervals, using samples drawn at constant rate over as long a period of time as possible. The aim should be 3% of CO_2 and total inerts not exceeding 10%.

In controlling production in a works, steam production and utilization is very important. The aim is to make the works self-supporting in steam as supplied by the waste heat boilers and to eliminate the use of solid fuel boilers, to which end a certain amount of long-term planning is required. It is necessary to know the availability of steam during the various seasons of the year, and the requirements of the steam using plant for the corresponding periods. In the Perth works this planning has been going on for a considerable number of years, and fairly extensive testing of the carbonizing plant, steam raising and steam utilization plant has been carried out, in co-operation at one stage with the Mobile Testing Unit of the Ministry of Fuel and Power, which has now been incorporated into the National Industrial Fuel Efficiency Service. Briefly, the system now operated is that the works is self-supporting in steam, except during severe weather conditions when steam is required for anti-freezing purposes and in certain other low load conditions. Steam is used for exhauster drive, boiler feed pumps, tar and liquor pumps, one water pump for pumping water from the River Tay to an overhead storage tank, circulating pumps for the dri-gas plant, coke quenching pump, compressor, and steam to producers, when the step grate producers are working. Other prime movers are electrically driven, while the hot condenser water is used for boiler feed purposes. An exhaust steam system, operating at 5 lb. per sq. in. supplies steam for purifier heating, detarrer, office and garage heating and dri-gas evaporation, while retort steaming is supplied either by exhaust steam from the waste heat boiler turbine or live steam when the turbine is off, the new waste heat boiler being fitted with alternative steam turbine or electric motor drive. The anti-frost steam requirements used in severe weather conditions amount to about 5,000 lb. per hour and this amount can only be supplied by bringing a solid fuel boiler into action.

In the course of just over two years, with its change from summer to winter conditions, several improvements have been made. The solid fuel boiler was shut down, and the evaporation of the waste heat boiler increased from 2.0 lb. to 2.9 lb. per lb. fuel used in the producer, which is quite a reasonable figure for a natural draught boiler. The improvement was achieved mainly by adjusting draught conditions to the minimum required for complete combustion in the setting, reducing excess air in the setting, and pointing up brickwork to reduce air ingress into the waste gas stream, associated with these being an increase in the CO_2 content of the waste gases at the boiler inlet from 7.5% to 13%. At the time this steam balance was estimated the augmentation flue was in use, but the damper was fully closed though not sealed, the object being merely to keep the flue warm in case of sudden demands for extra steam. The extractor engine was replaced by an electric motor, feedwater pre-heating now being done by the hoist engine exhaust, and steps were taken to minimize the waste of steam through badly fitting valves in the hoist engine. The scrubber pump is in very poor condition, and its use was minimized by reducing the volume of water circulated and supplying an increased volume of town's water. In order to conserve steam which could be used for new boosters to be installed it was proposed to replace the scrubber pump and tar pump by electric motors, but replacement of the hoist engine by electric drive was rather more problematical, since without this steam usage there would be a certain amount of surplus steam for which no use could be found. The use of the solid fuel boiler has been discontinued, and any heavy intermittent demands for steam are met by using augmentation. The solid fuel boiler will still be required for steaming holders, *etc.*, during frosty weather.

Horizontal Retorts

The control of production in the works using horizontal retorts which I have come across is rather a different problem from that experienced in vertical retort works, mainly because of the size of the undertakings involved. It is uneconomic to spend a great deal of time or money on these plants, especially where working results have been sufficiently good to make any substantial improvement unlikely. One of the commonest faults found in horizontal retort practice is failure to keep an adequate depth of fuel bed in the producer. If the producer contains insufficient fuel, there is insufficient time for the air passing through the fire to react properly with the incandescent coke, and the reaction tends to produce more CO_2 and less CO than should be the case. The minimum depth of fuel for good working is 3 ft., and the fire should always be levelled after charging so that the fuel bed burns down evenly. Where the producer has not been properly filled and levelled it is quite easily noticed how hot the top of the producer becomes, sometimes exceeding the temperature in the combustion chamber. As with vertical retort plants most troubles are caused by the producer, and it is here that maximum supervision is necessary and maximum effort must be applied to achieve economy. Water is used on the producer bars and has three main functions: (a) To cool the fire bars; (b) to cool the bottom part of the fuel bed; (c) to react with the hot coke to make water gas.

The water should be carefully controlled, at constant rate so as to supply sufficient, but not so much as to flood the ashpan. A useful figure is ¼ pint of water per lb. of coke used, and a milk bottle is usually easily found to measure it. The amount of unburnt coke discharged with the producer ashes appears to be higher in horizontal retort practice than is the case with vertical retorts, and it is worth while hand picking

this coke, which is useful as a boiler fuel or can be recharged to the producer. The tendency in horizontal retort practice seems to be to form clinker much more readily than in vertical retort practice, and it does not seem to be such an easy matter to keep the fire clinker free, even with a well controlled water supply to the grate. Considerable improvement can be made in horizontal retort settings by pointing up and cement washing, and in at least two cases I know of a day's work by a bricklayer on the outside walls of the settings resulted in a temperature increase of 50°C. in the combustion chamber. As with vertical retorts, if the producer is well worked, the only attention required in the setting is routine cleaning. If heats go back, the fault lies in the producer, and it is seldom necessary or advisable to alter settings of air slides or dampers. It is essential, of course, to work out a retort charging programme, and this is usually rather difficult in small works which work only two shifts per day. There is a definite relationship between temperature, weight of charge and time required to carbonize the charge, and it is not always advisable to carry high heats with quickly carbonized charges. It may be worth while reducing temperatures and using a longer carbonizing period. It does usually pay, however, to use as large a charge as possible, which has to be well laid, of even thickness throughout its length, and this is where the stoker plays his part. In the settings to which we are accustomed a 9 ft. retort will take a 3 cwt. or 3½ cwt. charge of Fife coal and completely carbonize it in five or six hours. The declared calorific value has been 500 B.Th.U. in most cases, except where dilution plants have been installed, in which cases 475 is used. Dilution should not be by overpulling—but this is a subject worthy of a paper by itself, and so I do not propose to say any more about it at this point. The use of steam in small horizontal works has many disadvantages, and in the Perth Group the constant use of steam is being eliminated in all but the one largest horizontal works. In all the other works the boilers are being retained for intermittent use only, such as for steaming tar wells before pumping, and de-frosting. Exhausters are driven by electricity with gas sets as standby.

Coke Sales Circle—Visit to Beckton

On October 19, 1955, through the courtesy of the North Thames Gas Board, over 100 members of the Coke Sales Circle visited Beckton Gas Works. The journey to Beckton was made by motor launch from Westminster Pier, luncheon being served on board. On arrival at Beckton, the party were received by Mr. Leslie Smith, and were taken round the Works by motor coach, stopping at points of interest.

They saw the batteries of coke ovens and watched one unload the coke into wagons, the wagons passing to the quenching apparatus. The party were also shown over the extensive producer and water gas plants, and followed the processes through from start to finish. They also toured the extensive coke stocking grounds and watched the various methods of coke handling employed there. After the tour, the party were entertained to tea by the North Thames Gas Board in their canteen, where they were joined by Mr. D. G. Rose, Coke Manager to the Board.

Wales Washing Competition

B.B.C. Television expert on household arts, Mrs. Marguerite Patten, last week visited the Wales Gas Board showrooms to announce winners and present prizes in the 'Ways with Washing' competition. The Wales Gas Board held it in co-operation with Messrs. Thomas Hedley, using their product 'Daz' as the subject for whitest washing. The competition was held throughout the whole of Wales with three prize winners in the North and three in the South. Mrs. Patten, who chose the winners, gave a talk on 'Washing without Soap' and demonstrated modern washing techniques to an audience of housewives with the aid of one of the Board's gas washing machines. Mrs. A. H. Williams, of St. Mellons, Cardiff won first prize in the South Wales Area for her hints on ironing lightly starched pillowslips and bolster cases. In the North Wales Area the first prize went to Mrs. Mary Angus of Abergele Road, Colwyn Bay for tips on the treatment of newly knitted woollies.

'BON VIVEUR' AT MIDDLESBROUGH

Phyllis and John Cradock, the 'Bon Viveur' team, presented their well-known act 'Kitchen Magic', in the Middlesbrough Town Hall, on October 26. The programme consisted of party dishes for Christmastide, and the evening, organized by the Northern Gas Board, proved most enjoyable and successful.

Millions to See C.U.C. Display

The London Regional Committee of the Coal Utilization Council has obtained the lease for one year of a showcase 54 ft. wide at Hyde Park Underground Station for exhibition purposes. This is the first time the Committee has ventured to stage a permanent exhibition at a busy centre. London Transport estimate that 10 million people will use the station in the next 12 months.

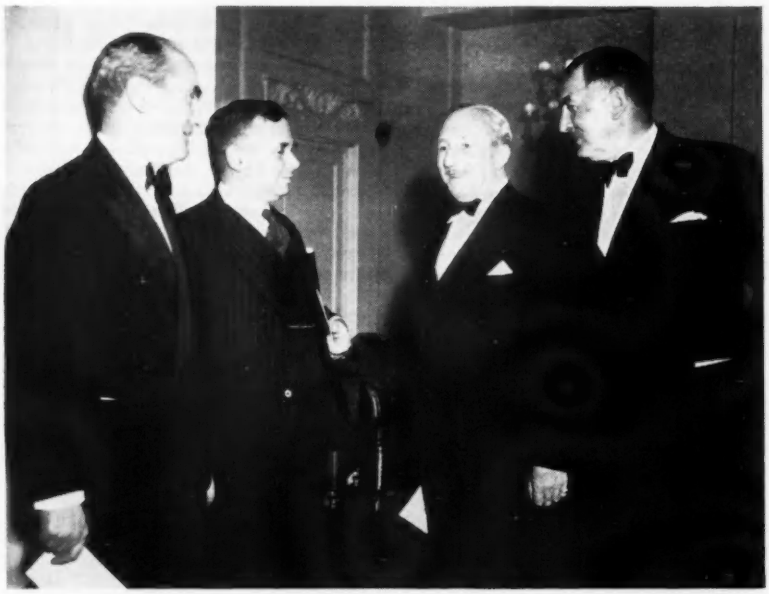
The first display, which opened on November 7, is divided into four sections —room heating, cooking, solid fuels and water heating. A new type of convector fire is shown, and a series of panels with photographs of other types of space heating appliances lead to a model setting out the advantages of solid fuel.

Visit to Consett Iron Company

On October 27, about 25 members of the North of England Section of the Institution attended the Consett Iron Company's Works for an inspection of part of the plant. After seeing the power station, which apart from controlling the electric current supply throughout the works, also controls the flow of producer gas, coke oven gas and steam, they saw the new rolling mills.

At tea afterwards, Mr. W. Sutcliffe (Chairman) thanked the Company for their hospitality, and said they had been most impressed with what they had seen. Mr. F. B. George (Works General Manager, Consett Iron Company) replied briefly and apologised for the absence of Mr. H. Boot, the Managing Director.

BRITISH ROAD TAR ANNUAL DINNER



Mr. W. K. Hutchison, C.B.E., President of the British Tar Association, on left, with the Minister of Transport and Civil Aviation, the Rt. Hon. J. Boyd-Carpenter, at the Association's annual dinner at Grosvenor House on October 25, exchange greetings with the Chairman of the Gas Council, Sir Harold Smith, K.B.E., and Mr. J. Davidson Pratt, C.B.E., Chairman of the Council of the Association.

Gas Pressure-drop Scare

A five-minute drop in gas pressure between 3.35 p.m. and 4.40 p.m. in the flow of gas from Birkshall Gas Works, Bradford, on October 28, which supplies most of the gas to the city, led to the North Eastern Gas Board taking top priority safety measures. The pressure drop, which affected a large area, could have extinguished supplies to gas appliances in use at the time. Some 200 Gas Board workmen were rushed in a fleet of vans to the districts concerned, and the police and five loud-speaker cars were used to warn people of the danger to make sure that gas was not escaping from unlit appliances. A rapid check was made (last night) on every known building using automatically controlled appliances, and where the occupier could not be located the gas was shut off from an outside valve. Mr. C. A. Newham, the Bradford Group Manager, who saw the gas pressure from the gasworks drop to about seven-tenths of normal, which is a little below the minimum, stated that the pressure drop was due to an accident in operating valves. The 'human element' was involved and there was no technical fault.

At a recent meeting of Crewe Corporation Central Town Improvements sub-committee it was agreed to keep in mind a request from the North Western Gas Board for a good site in the new shopping centre to be built in the town. In a letter to the committee, the Board explained that the present service centre was inadequate for the town's requirements.

Gas Industry in Ulster

Reviewing the problems facing the gas industry in Northern Ireland, Alderman J. D. Murphy, Coleraine, says: 'The gas industry in Northern Ireland is faced with a serious situation, so much so that local authorities and privately-owned gas companies are asking the Government to take over control. The problem is not only the rising price of coal, but the deteriorating quality of coal and the increasing interest charges on loans. The question of interest charges is amply illustrated by the annual report of the Gas Council of the Nationalised Industry in Great Britain.'

Alderman Murphy records that in Coleraine the Borough Council Gas Manager is experimenting with oil to substitute in part for coal. If this should prove successful it would have, without a doubt, a very great effect on the gas industry of the province. 'The search for new materials and new uses for industry is never ending. That is progress. That is the life of a nation. While we have those who cry that we have no mineral resources and that we cannot do anything, others are marching forward with the great changes now taking place. The Northern Ireland people cannot be spectators in this new changing world'.

Employees of the Swindon Division of the South-Western Gas Board, were presented with long service certificates recently, by the chairman, Mr. C. H. Chester. Eighty-four men have completed more than 25 years' service, and some have over 40 years to their credit.

Manchester Section I.G.E.

Methods of scientific control in the gas industry were examined and discussed at the meeting of the Manchester and District Section of the Institution of Gas Engineers, held at the Grand Hotel, Manchester, on October 27. A paper on the subject by Mr. L. G. Townsend, chief chemist, Liverpool Group, North Western Gas Board, outlined the organization developed in the Liverpool Group of North Western Gas Board. Mr. J. McLusky and Mr. R. L. Greaves expressed the thanks of the Section to Mr. Townsend.

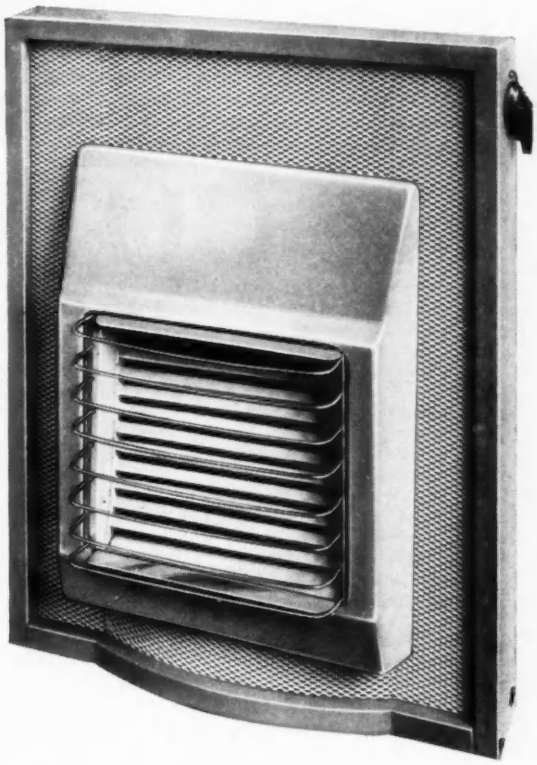
Membership

Mr. A. H. Nicholson (Hon. Secretary) reported the admission of the following new members:—H. S. Cheetham, Director, Woodall-Duckham Construction Co., Ltd., London; P. W. Clark, B.MET., PH.D., Chief Technologist, J. & J. Dyson, Ltd., Stannington, Sheffield; N. E. Crass, B.SC.(TECH.), Production Control Manager and Executive Director, West's Gas Improvement Co., Ltd., Manchester; C. Dawson, A.M.I.MECH.E., Chief Engineer, West's Gas Improvement Co., Ltd., Manchester; S. S. Francis, M.INST.F., Chief Sales Engineer (Gas), Woodall-Duckham Construction Co., Ltd., London; J. G. Gaunt, District Engineer and Manager, N.E.G.B., Spenborough; J. S. Mann, Senior Industrial Engineer, N.W.G.B., Burnley District, East Lancashire Group; J. Rimmer, A.M.I.MECH.E., Group Training and Education Officer, N.W.G.B., South Lancashire Group; A. Walker, District Engineer (Distribution), N.W.G.B., Burnley District, East Lancashire Group.

Mr. W. G. Hilton (Liverpool) was presented with the Associate membership examination certificate in gas engineering (manufacturing). Members stood in silence as a mark of respect to Mr. G. P. Mitchell, who died recently. He had been managing director and chief engineer of the Worcester New Gas Light Co. and a member of the Manchester District Association of Gas Engineers from 1920 to 1950.

Mr. W. S. Hubbard, who presided, stated that the next meeting on December 9 would be a joint meeting with the North Western Section of the Institute of Fuel. The theme of the meeting would be Coke Manufacturing Problems.

In every round of the 'Cookeen' apple tart series contest the competitors are given a choice of cooking their entry by gas or electricity. So far, only one person out of the thirty finalists who have taken part in six contests in Sheffield, Blackburn, Manchester, Middlesbrough, Newcastle and Aberdeen, has chosen an electric cooker. Gas has been favoured all the way, and it is an indication that the finest results are obtained by gas cooking. The cooker to be used in the Glasgow finals on December 1 will be De La Rue G4's in burgundy and grey, which have been ena for the occasion by the Scottish Gas Board.



They'll want to see The CONRAY Gas Fire

All of your consumers still using an old-fashioned method of heating are potential ConRay owners. An extensive advertising campaign has been planned to introduce the ConRay to the home owner, and emphasis is on ConRay's obviously superior design and convector radiant heat principle. Make sure you are in a position to take advantage of the many enquiries you'll be receiving in the next few months.

ConRay

CONVECTOR RADIANT FIRE

For details, write to GENERAL GAS APPLIANCES LTD., Corporation Road, Audenshaw, nr. Manchester.

Proprietors: Allied Ironfounders Ltd., makers of cookers, boilers, fires and baths

SAML. CUTLER & SONS LTD.

Specialists in all types of Gasworks plant and Steel Constructional work

70, VICTORIA STREET, WESTMINSTER, LONDON, S.W.1.

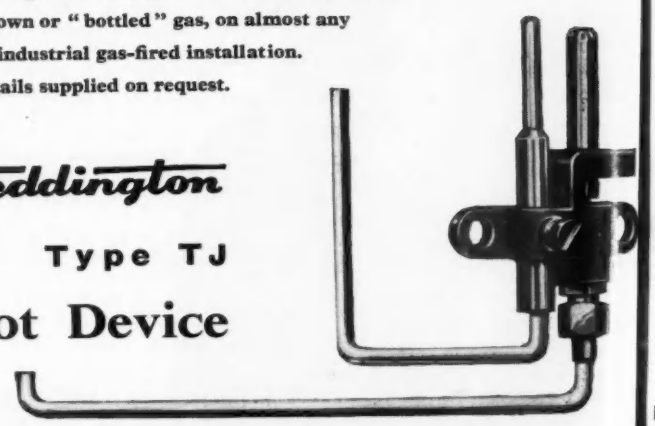
Telephone : Tate Gallery 9592.
Telegrams : Retortus, Sowest, London.

PROVIDENCE IRON WORKS, MILLWALL, LONDON, E.14.

Telephone : East 5231-2.
Telegrams : Cutler, Millwall, London.

Pilot Flame Safety

The Teddington TJ Pilot Device withholds gas from main burner till pilot is properly alight, and cuts if off from both burners if pilot is extinguished. Can be used with either town or "bottled" gas, on almost any type of industrial gas-fired installation. Full details supplied on request.



Teddington

Type TJ

Automatic Pilot Device

THE BRITISH THERMOSTAT COMPANY LIMITED Sunbury-on-Thames, Middlesex

TEL.: SUNBURY-ON-THAMES 456. TELEGRAMS AND CABLES : THERMOSTAT, SUNBURY-ON-THAMES, TELEX. TELEX : 2-2742 TEDDCONTSN IRY

Midland Juniors Visit to Meters Limited

Members of the Midland Junior Gas Association who made the long journey to Oldham to see round the works of Messrs. J. & J. Braddock and George Orme & Co. on October 27 were well repaid. For the quality of the craftsmanship seen and the welcome and hospitality received were of a very high standard. The two firms mentioned, together with Sawer & Purves, form the Meter Limited Group, but in the time available it was not possible to see round the Sawer & Purves works.

The history of the companies goes back a hundred years and more, the formation of Meters Limited taking place just before 1900. Originally all three companies concentrated on the manufacture of gas meters and brasswork, and it is believed that the first pre-payment meters to be used were supplied by Sawer & Purves to the old Liverpool Gas Company.

At the J. & J. Braddock works the visitors toured the Industrial and Domestic Meter Departments, where they saw the component parts being made, then the various processes of sub-assembly, final erection and works tests. They also saw testing stations of the Ministry of Fuel and Power, actually in the Braddock's works, and were shown by the Ministry examiners, the methods employed in testing domestic and industrial meters. Equipment is available for testing up to 50,000 cu.ft. per hour.

Of particular interest was the Central Development Department. There the party saw blue-prints and prototypes of the 4-D meter. This meter with four single-acting diaphragms is claimed to be the most accurate dry meter ever designed. By virtue of its design the meter maintains its initial accuracy of registration for a much greater period than is possible with the standard type. This is the largest meter made by the company.

Also on show in this department was the improved 'Simflex' safety cock and the predetermining counter. Demonstrating the versatility of this department the party saw high pressure charging equipment for aircraft. This is designed to operate at a working pressure of 6,000 lb. per sq. in.

Geo. Orme's Works

Since meter production had been seen at Braddock's, the Juniors in their tour of the Geo. Orme works omitted this section and saw instead the foundry, machine shop, automatic department, fitting shop and the inspection departments.

The design and production of gas meters remains the principal function of the Company, and indeed the Company stresses that technical experience gained in serving other industries benefits them in their constant search for the perfect meter. The members of the Association were entertained to luncheon by the directors of Meters, Limited, in the Union Club, Oldham, prior to the tour of inspection. Mr. W. A. Dobson, Director, who welcomed them, said how pleased and privileged they of Meters Limited were to have the opportunity of entertaining the Midland Juniors and showing them round. He felt they would see much to interest them, and he hoped that they would ask questions.

Mr. S. C. Crathorn, President of the Midland Junior Gas Association, replying, thanked Mr. Dobson for his friendly welcome. It had been some years since the Midland Juniors had gone round meter works, and they were keenly looking forward to the visit. Mr. Crathorn, continuing, said how pleased he was to see that some other guests had been able to come. Among those he mentioned were Mr. Pykett, an Honorary Member of their Association, Mr. H. Partington, President of the Manchester Juniors, and Mr. Frank Barker, formerly of Birmingham, now with the North Eastern Gas Board. Among those who helped to make the visit such a success were Mr. E. J. Perks, General Sales Manager of the Company, Mr. Reg Taylor and Mr. P. Davies, Area Sales Managers.

After the inspection of the works the visitors were entertained to tea, and here Mr. Crathorn thanked all those who had worked to make the day such a conspicuous success, and asked Mr. Dobson to convey the Association's thanks to the directors for their hospitality.

A group of members of the Midland Junior Gas Association outside the works of Meters, Ltd. In the front row can be seen Mr. S. C. Crathorn, President of the Association, Mr. W. A. Dobson, Director of Meters, Ltd., Mr. H. Partington, President of the Manchester Juniors, Mr. H. S. Reynolds, Secretary of Midland Juniors, and Mr. E. J. Perks, General Sales Manager of Meters, Ltd.

Sir Bernard Keen, D.Sc., F. Inst. P., F.R.S., has been appointed Scientific Advisor to Baird & Tatlock (London) Ltd. Until recently he was Director of the East African Agriculture and Forestry Research Organization.

The Minister of Fuel and Power has appointed Lt.-Col. P. W. Robinson, T.D., Managing Director of Messrs. T. Bond Worth & Sons, Ltd., of Stourport-on-Severn, to be a member of the Industrial Coal Consumers' Council.

The main feature in the October issue *of South Western Gas News,* the official organ of the South Western Gas Board, is a pictorial account of the final linking up of the 1,000th mile of main laid by the Board since vesting date.

SALES CHALLENGE IN NORTH WEST

The North Cheshire Group and the South Lancashire Group (N.W.G.B.) met at St. Helens, in a friendly battle of sales questions on October 20. Two hundred sales staff filled the hall under the Chairmanship of Mr. Stanley Hopkinson. Messrs. R. L. Greaves, John Grayston, and H. C. Jackson were also on the platform, and the 'neutral' questions master was Mr. A. Entwisle, Sales and Service Officer for Central Lancashire. The challengers, the North Cheshire Group, who had done this sort of thing before brought a team consisting of Miss Johnson, Home Service Adviser, and Messrs. F. Clair, W. Tomlinson and S. Howarth. South Lancashire had Miss Maureen Melville, Messrs. E. Bate, W. F. Jones and H. Allan. All aspects of Sales and Service were thereby represented. The result was a win for South Lancashire by a narrow margin, 57 marks against 54 for North Cheshire.

These photographs taken during the evening show, left, Mr. J. Grayston, Mr. H. C. Jackson, Mr. Stanley Hopkinson, the Chairman, Mr. Entwistle and Mr. R. B. Footer. Right, Mr. H. Allan, who obtained full marks for his reply to a question on the leakage of gas in premises where admittance is impossible.

Move to Raise Dublin Gas Prices

An application for permission to raise the price of gas by 1.5d. per therm has been made by the Alliance and Dublin Consumers' Gas Company to the Prices Advisory Body. Mr. M. J. Robertson, Manager of the Company, who asked that sanction of the application be treated as urgent, said it was to recoup increased costs which had been beyond the power of the Company to control.

The Company, he said, had made the greatest efforts to keep charges at the lowest possible level. Since the beginning of 1948 it had made substantial and successive price reductions, in total greater than the relatively small increases forced on it from time to time by increased costs of operation. The application was due to wage and salary increases, notice by the National Coal Board of Great Britain that coal would be increased by 5s. per ton from January 1 next, and increased operating expenses.

Mr. Robertson said the average number of employees during the current half year was 1,682, and estimated wage costs equalled £1,060 per week. The cost in the present half year (July 14 to December 31) was £25,440, and in a full year £55,120.

The increase of 5s. per ton for coal would amount to £47,980 (based on present estimated annual tonnage). The increase in costs of materials for maintenance renewals and sundries showed a net increased level of 18.4 per cent., equal to £49,425 per year. The Company was, therefore, faced with increases of £25,440 for the remainder of 1955 and £103,100 for the whole of 1956.

Mr. Robertson said that in connection with costs generally, the Company had offset a portion of these increases by 'operating efficiencies,' which brought the amount now claimed down to 1.5d. per therm.

The application was opposed by Mrs. Mairead McGuinness, Irish Housewives' Association, Mrs. Maureen O'Carroll, on behalf of the Power Prices Council, and Mr. E. Tucker, chairman of the Lower Prices Council, which, he said, represented a great many trade unionists. If the present application was granted, he said, they would be coming back to the Labour Court for further increases in wages. The Body will report to the Minister for Industry and Commerce.

Complaints about dust and smell from the gasworks at Leven, Fife, have been made by local householders and shopkeepers. It is thought to come from waste residue dumped from the gas retorts. Scottish Gas Board branch manager, Mr. D. Marshall, said the position was aggravated at the moment by the contractors working on a new gasholder. He explained that they were cramped for space, and as soon as the contractors had finished work something would be done about it.

Power-Gas to Build I.C.I. Plant

The Power-Gas Corporation, Ltd., have been appointed by Imperial Chemical Industries, Ltd., Billingham Division, to act as main contractors in connection with a substantial extension of their ammonia synthesis gas plant.

The plant, which will be built under the overall technical direction of I.C.I., is a new departure in this country. I.C.I. themselves are designing the oil gasification units in accordance with information supplied by the Texaco Development Corporation. Oil will be gasified with oxygen under pressure, and the equipment to be provided will also include oxygen plant, carbon monoxide conversion plant, gas purification plant and compressors.

As part of the purification train the Power-Gas Corporation, Ltd., are designing and supplying a plant for the removal of carbon dioxide and hydrogen sulphide by means of hot potassium carbonate solution.

Gas fittings at the homes of more than 12,000 elderly people who live alone have been inspected since May by maintenance men of the North Eastern Gas Board. One quarter had minor defects but only 160 were of a more serious nature and these were speedily dealt with by the landlords. Names and addresses of people over 65 living alone at Bradford were supplied to the Gas Board by the Bradford Old Peoples Welfare Committee.

GAS CONSULTATIVE COUNCILS

Eastern Area Developments

At a meeting of the Eastern Gas Consultative Council on October 25, Sir John Stephenson, C.B.E., J.P., Chairman of the Eastern Gas Board, addressed the Council on the subject of the Sixth Annual Report of the Eastern Gas Board. Among the topics Sir John raised in his speech, was that of research and development projects by the Board, in particular that of a process for sewage purification and that of a patent which the Board had taken out for obtaining germanium from flue dust. The Board, he reported, were considering seriously the importation of liquid gas, but there were many difficulties in connection with the transporting and handling of the liquid gas, and this was a matter which was receiving the attention of the Gas Council on behalf of the whole industry.

The Watford Divisional Committee reported the appointment of Mr. J. Allen, of the Shredded Wheat Co., Ltd., Welwyn Garden City, as a member of the Consultative Council for two years from August 8 last. The Watford Divisional Committee expressed their doubts of the value of the advertising on commercial television programmes, and felt that competitive advertising between the gas and electrical industries should be strictly controlled.

The Tottenham Divisional Council reported the additions to their numbers of Mrs. I. B. Bailey, Mr. C. T. H. Plant and Councillor J. Watkins.

The Minister of Fuel and Power has appointed Councillor Mrs. R. Hardy, of Foxhall, near Ipswich, to be a member of the Eastern Gas Consultative Council.

North Thames to Broadcast?

At the 59th meeting of the North Thames Gas Consultative Council held on October 27, Lt.-Col. L. T. Sawey, M.C., was welcomed as a new member. At the meeting the Chairman of the Council, Mr. Edwin Bayliss, D.L., J.P., L.C.C., reported that at a meeting of the Gas Consultative Council Chairmen with the Minister of Fuel and Power he had brought forward a suggestion that an attempt should be made to arrange for a radio or television feature on the work of the consultative councils. After giving details of earlier efforts in this direction, the Chairman stated that the Minister had agreed that each Area Council should endeavour to make its own arrangements for a broadcast, and he was, therefore, taking steps to see what could be organized for their area.

Wales and Mon. Juniors Learn Public Speaking

The monthly meeting of the Wales and Mon. Junior Gas Association held at Cardiff last week was a departure from the Association's normal procedure in that a non-technical speaker held the platform. It has been felt for some time that many members of the Association would like to come forward with a paper to read before a meeting, or perhaps take part in the ensuing discussion, but lacked the confidence to speak before an audience.

In order to help them to overcome this fear their meeting was designed to assist members in the art of acquiring the right technique of speaking in public, and Mr. Frank Candlin, who is organizer of leisure studies at the Cardiff Technical College was invited to lecture the members on this subject. Mr. Candlin itemized the essentials of good speech-making as follows:—(a) A matter of good speech; (b) Pleasing sound; (c) Preparation of Speech; (d) Selection of subject matter; (e) Arrangement of subject matter; (f) Choice of words; (g) Introduction of humour.

In reply to a question by Mr. S. G. Meade of Newport, Mr. Candlin said that sudden loss of words, a form of blackout or temporary paralysis, was due more to a sense of fear than lack of confidence. He advised anyone thus afflicted to know their subject really well.

'Aluminium in Building'

An exhibition, 'Aluminium in Building,' was opened by J. R. Bevins, Esq., M.P., Parliamentary Secretary, Ministry of Works, at the Building Centre, 26, Store Street (off Tottenham Court Road), London, W.C.1, on November 8, 1955, at 12 noon. The exhibition is to remain open daily from 10 a.m. to 5 p.m. until November 30. This exhibition has been prompted by the trend of enquiry from architects and builders into the potentialities of aluminium in buildings and is staged by the Aluminium Development Association with the co-operation of the Building Centre, the Aluminium Industry and companies manufacturing aluminium components, pre-fabricated structures and systems of roofing and cladding.

The purpose of the Exhibition is partly to form a challenge to architects and designers to make wider use of aluminium based on its well known properties, and partly to bring together the many applications of aluminium to building at the present time. It is being increasingly applied to buildings where maximum accommodation is required on difficult sites.

The Scottish Gas Board, in co-operation with Cadbury Bros., Ltd., are holding a series of chocolate cookery demonstrations throughout Scotland at gas showrooms.

Mr. Therm Takes a Wife

On November 1, at the Festival Hall, there came to a conclusion the 'Bride of the Year' competition which has been going on ever since March, 1954. The theme of the final contest was 'Can she cook like mother?' The twelve young brides who competed had to prepare a two-course meal suitable for the first visit of her parents-in-law, and to cope with a surprise item—a baked custard. Dame Vera Laughton Mathews conceived the idea of delivering to each of the kitchens a telegram in which the surprise item was revealed, but the brides were so busy that they told the 'telegraph boy' to put it down and then continued with their work. Dame Vera was then obliged to announce the item over the loudspeakers.

At the presentation of the prizes, Col. Sir Harold Smith, K.B.E., J.P., Chairman of the Gas Council, took the Chair, but after a short address, in which he commented that the judging was so difficult that the judges wished Mr. Therm could have been a polygamist, he was obliged to leave for another engagement.

Dame Vera then introduced the four judges, who spoke on varying aspects of the competition. The prizes were then presented by Miss Jeanne Heal. The prize winners were as follows: First, with a prize of £500, was Mrs. A. Marland, from the North Western Gas Board Area; second, with a prize of £250, was Mrs. E. Voge, from Scotland; third, with a prize of £150, was Mrs. K. Collett, from the Northern Area; and fourth, Mrs. M. Sanderson, from Wales, with a prize of £100. The eight runners-up each received a prize of £50.

Mrs. Audrey Marland, winner of the Gas Council's 'Bride of the Year' Competition.

The appliances used by Mrs. Marland were a Cannon A.125 cooker, an Ascot RS. 52 water heater, a Parkinson 'live water' washing machine, a Victor drying cabinet, and an Easiclene refrigerator.

THOMAS BAYLEY (GREAT BRIDGE) LTD.
BAGNALL STREET, GREAT BRIDGE, STAFFS.
Telephone: 1587 Tipton
Manufacturers of Best Staffordshire Blue, Brown and Red Engineering Bricks
Blue pressed and Wirecut Paviors for Hopper Linings and Retort House Floors

J. BROWN & CO. LTD.
SAVILE TOWN, DEWSBURY, YORKS.
Supply:– "BROWNOX-de-LUXE" PURIFYING MATERIAL
Purchase:– SPENT OXIDE

COMPRESSORS & EXHAUSTERS FOR AIR AND GAS.
See our Advertisement Next Week.
REAVELL & CO. LTD. IPSWICH.

CASES FOR BINDING
Quarterly Volumes of the 'Gas Journal'
7/6 each, post free
Walter King, Ltd., 11, Bolt Court, Fleet Street, London, E.C.4.

UNDERPRESSURE ENGINEERING CO., LTD.
UNDERPRESSURE CONNECTIONS
SPLIT COLLARS
SOCKET CLIPS
UNION FOUNDRY, MANSFIELD, NOTTS.
ALL TYPES OF DISTRIBUTION MATERIAL IN STOCK
Service Enquiries:
STAFFORD HOUSE, NORFOLK STREET, STRAND, W.C.2.
'Phone: MANSFIELD 1256. 'Grams: CASTINGS, MANSFIELD.
'Phone: TEMPLE BAR 9910. 'Grams: WASHER, ESTRAND, LONDON
CENTRAL ACTION DRILL STANDS
SERVICE CLEANSERS
TOOLS, ETC.

COAL AND COKE SCREENING & SIZING PLANTS.
RETORT SETTINGS PRODUCERS, FURNACES REPAIRS.
GOODALL, CLAYTON & Co. LTD.
LEEDS.
CONVEYORS, ELEVATORS, BUNKERS, ROOFS, HOISTS, Etc.

GAS RETORTS
HARRIS & PEARSON LTD
STOURBRIDGE. ENGLAND.
INSULATING BRICKS, RECUPERATOR TUBES, SPECIAL SEMI-SILICA QUALITY FOR SEGMENTAL RETORTS WITH NO EXPANSION OR CONTRACTION AT 1400° C
Manufacturers of
Fire Bricks, Lumps & Tiles
OF EVERY DESCRIPTION

PUBLISHERS' NOTICE

The " Gas Journal " is published every Wednesday, price 1/6d.; by post 1/8d.

Subscription Rates: Home and Empire:—60/- per annum; Foreign:—70/- per annum. (Both payable in advance.) A copy of the " Gas Journal " Calendar & Directory is presented each year to continuous subscribers.

Classified Advertisements: All small classified advertisements are charged at 2/- per line (approx. 7 words)—minimum charge 10/-. A Box Number address occupies 2 lines, and a further 6d. is charged towards cost of postage on replies. Copy must be received by first post on Monday to ensure insertion in that week's Journal.

Displayed Advertisements: Rates obtainable on application to the Business Manager. Change of copy for displayed spaces must be received 14 days prior to publication if proofs are required. Type area of inside pages 10 in. deep × 7 in. wide; block screen 120.

BUSINESS MANAGER: S. T. CULLEN

MIDLANDS MANAGER: G. B. Torrance, 42, Wychall Lane, King's Norton, Birmingham, 30. *Telephone:* King's Norton 3868.

NORTHERN MANAGER: Philip W. B. King, Flat 1, 7 Langcliffe Avenue, Harrogate. *Telephone:* Harrogate 67625.

SOUTHERN REPRESENTATIVE: A. Engelhardt, T.D., 11, Bolt Court, Fleet Street, E.C.4. *Telephone:* Fleet Street 2236-7.

WALTER KING, LTD., 11, Bolt Court, Fleet Street, London, E.C.4.

Telephone: FLEet Street 2236-7. *Telegrams:* Gasking, Fleet, London.

OXIDE

DUTCH AND DANISH BOG ORE
SPECIALLY ACTIVATED OXIDE OF IRON

Oxide supplied on loan or sale outright.
Highest prices paid for Spent Oxide

Send your enquiries to

GAS PURIFICATION LIMITED

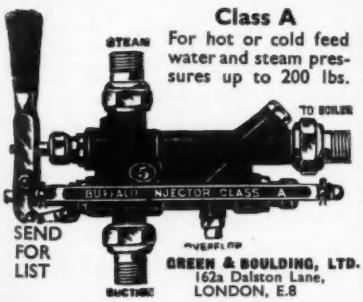
PALMERSTON HOUSE, BISHOPSGATE, LONDON, E.C.2.

Telegrams: "Purification, Stock, London." Telephone: London Wall 7938/9 & 7930

BUFFALO INJECTORS

Class A

For hot or cold feed water and steam pressures up to 200 lbs.



SEND FOR LIST

GREEN & BOULDING, LTD.
162a Dalston Lane, LONDON, E.8

"KLEENOFF" *
THE COOKER CLEANER

"KLEENOFF"
FIBRE BRUSHES
RUBBER MOPS

"KAY-DEE" *
KETTLE DESCALER

for resale to the public and in bulk for works use.

BALE & CHURCH, LTD.
7, CROMPTON WAY, CRAWLEY, SUSSEX

SOLVE PROBLEMS OF ABSENTEEISM FLOOR SPACE WELFARE

WITH THE **AIR-DRY SIEBER HANGER SYSTEM**

Patent No. 415653
Des. Reg. No. 789558

★ **HEALTH** damp clothing thoroughly dried and aired.
★ **HYGIENE** no musty cupboard odour, no dirt traps.
★ **SPACE** floor space saved pays for initial outlay.
★ **COST** low—yet service everlasting.

Installed in Factories, Stores, Shops, Hospitals, etc.

JAMES SIEBER EQUIPMENT COMPANY LTD.
33, Africa House, Kingsway, London, W.C.2
Telephones: HOLborn 5121 & 4531

PATENTS

KINGS PATENT AGENCY, LTD.
(Director, B. T. King, A.I.M.E., Patent Agent) Advice, Handbook, and Consultations free. 146a, Queen Victoria Street, London, E.C.4. 'Phone: City 6161.

APPOINTMENTS VACANT

The engagement of persons answering these advertisements must be made through a Local Office of the Ministry of Labour or a Scheduled Employment Agency if the applicant is a man aged 18-64 inclusive or a woman aged 18-59 inclusive unless he or she, or the employment, is excepted from the provisions of the Notification of Vacancies Order, 1952.

SOUTH WESTERN GAS BOARD

TECHNICAL ASSISTANT—DISTRIBUTION

APPLICATIONS are invited for the post of TECHNICAL ASSISTANT—Distribution in the Bath District.

Applicants should have a sound theoretical knowledge and some practical experience in both Mains and Fittings work; Drawing Office experience would be an advantage.

Duties will comprise technical work, generally within the district, and include acting as Clerk of the Works on occasions, the execution of district pressure surveys and assisting with the preparation of distribution schemes.

The commencing salary will be within the range of A.P.T. Grade 5/7 (£530-£700) per annum, according to experience and qualifications. A Board owned house will be available for occupation by the successful applicant, subject to a charge to be determined.

Applications giving age, education and qualifications, together with full details of posts held and experience, should be addressed to the Divisional Engineer & Manager South Western Gas Board, Radiant House, Bristol, 1.

THE UNIVERSITY OF LEEDS

RESEARCH staff required for intensive research programme on the chemical, biological and chemical engineering aspects of industrial waste disposal.

There are opportunities for appointments at both senior and junior levels; for the former, appropriate scientific qualifications and experience in one of the fields mentioned would be required. For the junior appointments, applicants should have a degree or equivalent scientific qualification and experience would be an advantage, but is not essential.

Salaries according to qualifications and experience. Applications (three copies) stating date of birth, qualifications and experience, should reach the Registrar, The University, Leeds, 2 (from whom further particulars may be obtained), not later than November 30, 1955.

SCOTTISH GAS BOARD

WESTERN GROUP
GREENOCK, GOUROCK & PORT GLASGOW DISTRICT
ASSISTANT DISTRIBUTION SUPERINTENDENT

APPLICATIONS are invited for the post of Assistant Distribution Superintendent in the above District.

Applicants should have a sound theoretical knowledge and practical experience in both Mains and Fittings work; Drawing Office experience would be an advantage.

The commencing salary will be within the range of A.P.T. Grade VI (£565-£645 per annum), according to qualifications and experience. The successful candidate may be required to pass a medical examination.

Applications giving age, education and qualifications, together with full details of posts held and experience, should be addressed to the undersigned to reach him within 10 days of publication of this advertisement.

WILLIAM KIRK,
District Manager.

Inchgreen Gas Works,
Greenock.

November 4, 1955.

SCOTTISH GAS BOARD

KILMARNOCK GROUP
NEWTON-ON-AYR DISTRICT
TECHNICAL ASSISTANT

APPLICATIONS are invited for the position of TECHNICAL ASSISTANT to the Newton-on-Ayr Gas Undertaking.

Applicants should possess the Leaving Certificate of the Education Department to the standard required by the Engineering Joint Examination Board for exemption from the common Preliminary Examination, or equivalent, or the Ordinary National Certificate of one of the Engineering Institutions. Applicants must be prepared to follow an appropriate course of study leading to an approved qualification in Gas Engineering.

The salary offered will be in accordance with the National Joint Council Scales for Gas Staffs, Grade 2/3, £360-£535 per annum with placing according to qualifications. The post will be superannuable and the successful applicant will be required to pass a medical examination.

Applications, giving age and full details of training and experience, should reach the undersigned within 14 days of the appearance of this advertisement.

Copies of Testimonials should be submitted, or the names of two persons to whom reference can be made.

C. E. N. FRESHNEY,
District Manager.

Gas Works,
Newton-on-Ayr.

(*Classified advertisements continued on page* 408)

There are all sorts of photographs . . .

. . . ranging from furtive to fine art. Whatever sort you want, the answer is always in the negative, if you see what we mean. But if you want *positive* results in industrial photography you could not do better than contact **Walter King Photographs,** 11, Bolt Court, Fleet Street, E.C.4. (Tel. FLEet Street 2236)

WALTER KING WK PHOTOGRAPHS

The sign of BETTER Photography

APPOINTMENTS VACANT (*ctd.*)

NORTH WESTERN GAS BOARD

EAST LANCASHIRE GROUP
PLANT MAINTENANCE ENGINEER—GREENBANK WORKS, BLACKBURN

APPLICATIONS are invited for the above pensionable appointment at a salary within Grade A.P.T. 9 (£700-£800 per annum).

Candidates should have had practical experience in the erection and maintenance of mechanical and electrical plant and the possession of mechanical engineering qualifications will be an advantage.

The Plant Maintenance Engineer will be responsible to the Station Engineer for the maintenance of all plant and records at the Greenbank Works, the control of workshops and craftsmen and the supervision of contractual work as required.

The successful applicant will be required to occupy a house on the Greenbank Works.

Detailed applications, giving the names of two referees, should reach the General Manager, N.W.G.B. (East Lancashire Group), Cardwell Place, Blackburn, within 14 days.

EASTERN GAS BOARD

(CAMBRIDGE DIVISION)
FEMALE HOME SERVICE ADVISER
PETERBOROUGH DISTRICT

APPLICATIONS are invited for the position of HOME SERVICE ADVISER at the Peterborough District. Candidates should possess a recognised Diploma in Cookery or Domestic Science and be capable of giving expert advice on the use of domestic gas appliances, conducting public demonstrations, and district home service calls. Salary will be within the range of £430 to £494, the initial placing depending on age and experience.

The successful candidate may be required to pass a medical examination, and unless already subject to a Pension Scheme by virtue of the Gas (Pension Rights) Regulations 1950, will be required, if eligible, to join the Board's Staff Pension Scheme within six months from taking up the appointment.

Applications stating age, experience, present position, training and qualifications, together with the names of two referees, should reach the undersigned within 14 days of the appearance of this advertisement.

J. HUNTER-RIOCH,
General Manager.

52, Sidney Street,
Cambridge.
October 27, 1955.

ASSISTANT required development section gas burner specialists. Intelligent, all round mechanic capable of producing prototypes from ideas. Engineering drawing an advantage. Permanent, interesting and progressive post for right man. Apply: Aeromatic Co., Ltd., Industrial Estate, Uxbridge, Middlesex.

WALES GAS BOARD

TECHNICAL ASSISTANT (ENGINEERING)
PONTYPOOL UNDERTAKING

APPLICATIONS are invited for the position of TECHNICAL ASSISTANT (Engineering) to the Pontypool Undertaking.

Applicants must have had a good Drawing Office experience and be able to prepare works layout, pipe work and steel work details. Experience with a Contractor and/or technical knowledge of Gasworks processes will be an advantage. Possession of the Higher Grade Certificate in Gas Engineering or equivalent qualification will be an advantage.

The commencing salary will be within Grade A.P.T. 7 (Provincial A) (£620/£700) per annum of the National Salary Scale for Gas Staffs. The post is pensionable.

The successful candidate may be required to pass a medical examination.

Applications stating age, qualifications and experience, together with details of present and previous appointments and the names of two referees, should be received by the undersigned not later than November 21, 1955.

A. FACER,
General Manager.

Gas Offices,
Hanbury Road,
Pontypool,
Mon.

WALES GAS BOARD

TECHNICAL ASSISTANT, DISTRIBUTION ENGINEER'S DEPARTMENT

APPLICATIONS are invited for the position of Technical Assistant in the Distribution Engineer's Department.

The duties of the successful candidate will consist of work on the design, installation, maintenance and control of systems of Cathodic Protection. Duties will also include work on the ultrasonic testing of welds and other special work. Applicants should have a sound knowledge of Physics, Chemistry and Electricity and should hold, as a minimum qualification, the Ordinary National Certificate in Applied Physics or Electrical Engineering or its equivalent. Special consideration will be given to applicants who have taken special courses in Radar, either in H.M. Forces or in civilian life.

Experience in the Gas Industry is desirable, but not essential. The salary payable will be in Grade A.P.T. 7A (£620/£700) and the post is pensionable.

The successful applicant will be required to pass a medical examination.

Applications for the above position, giving details of age, qualifications, experience and present position, together with the names of two referees, should reach the undersigned not later than November 18, 1955.

C. B. MAWER,
Secretary.

Wales Gas Board,
2, Windsor Place,
Cardiff.

WALES GAS BOARD

ASSISTANT DISTRIBUTION ENGINEER (TRANSMISSION)

APPLICATIONS are invited for the position of ASSISTANT DISTRIBUTION ENGINEER (Transmission).

The successful applicant will be under the Board's Distribution Engineer, responsible for the design and construction of transmission systems for the bulk transport of gas. A considerable amount of such work is contemplated, much of it consisting of pipe lines working at pressures higher than normally used by the Gas Industry in Great Britain.

Candidates should have a high educational standard and hold the minimum qualification, the Higher Grade Certificate in Gas Engineering (Supply) of the Institution of Gas Engineers or its equivalent. Experience of large scale main laying operations and knowledge of their design and supervision is essential.

This appointment provides an exceptional opportunity to take a leading part in new and very extensive work.

The salary payable will be in accordance with the knowledge, qualifications and experience of the successful candidate, but will not be less than £1,100 per annum. The post is pensionable.

The successful candidate will be required to pass a medical examination.

Applications for the above position, giving details of age, qualifications, experience and present position, together with the names of two referees, should reach the undersigned not later than November 18, 1955.

C. B. MAWER,
Secretary.

Wales Gas Board,
2, Windsor Place,
Cardiff.

WALES GAS BOARD

HOME SERVICE ADVISERS—PONTYPOOL GROUP

APPLICATIONS are invited for the positions of HOME SERVICE ADVISER (Senior post) and Home Service Adviser in the Pontypool Group.

Candidates should possess a recognised qualification in Domestic Science and have experience in the organisation of Cookery Demonstrations, Lectures and District Home Service Calls.

The commencing salary will depend on qualifications and experience and will be as follows:—

Home Service Adviser (Senior post)—Grade A.P.T. 5 (Female) of the National Salary Scales (£450-£523) per annum.

Home Service Adviser—Grade A.P.T. 4 (Female) of the National Salary Scales (£298-£450) per annum.

The successful applicants may be required to pass a medical examination and to subscribe to the Board's Superannuation Scheme.

Applications stating age, qualifications, experience and the names of two persons to whom reference can be made, should reach the General Manager, Gas Offices, Hanbury Road, Pontypool, not later than November 21, 1955.

NORTH THAMES GAS BOARD

THE following SENIOR DRAUGHTSMEN are required in the CHIEF ENGINEER'S Drawing Office at WESTMINSTER, S.W.1.

(i) For the design and layout of general process plant and all associated structural steelwork.

(ii) For the design of materials handling plant and the detailing of associated steelwork.

Candidates should preferably be corporate members of the Institutions of Civil, Structural or Mechanical Engineers. Starting salaries within the range £790-£940 per annum, according to age, qualifications and experience. The successful candidates will be required to join the staff pension scheme.

Applications, giving age and full particulars, should be sent to the Staff Controller, North Thames Gas Board, 30, Kensington Church Street, W.8, quoting reference 666/191.

COKE OVEN MANAGER required for plant in North. House available. Applicants should state age and experience to No. 262, *Gas Journal*, 11, Bolt Court, Fleet Street, London, E.C.4.

PLANT FOR SALE

FOR SALE: NEW GAS-FIRED BOILER by Hartley & Sugden. 160 lbs./hour at 80 lbs. p.s.i., complete with chimney, spare burner and controls. Original purchase price was £419. Our price £200. W. H. COLLINGBOURNE & CO., LTD., 1481, Stratford Road, Birmingham, 28. Phone: Shirley 3303.

DOMESTIC UTILISATION OF GAS

SMITH & LE FEVRE

20/- *inc. postage*

WALTER KING, LTD.

11, Bolt Court, Fleet Street,

E.C.4.

The
LIMIT OF EFFICIENCY CAN BE REACHED
by the use of

LUX

GAS PURIFYING MATERIAL

Sole Importers:
HARRISONS (London) LIMITED
66, Mark Lane, LONDON, E.C.3
Telegrams: Birchrock, London *Telephone:* ROYal 3120

Designed for the job...

HOLMES

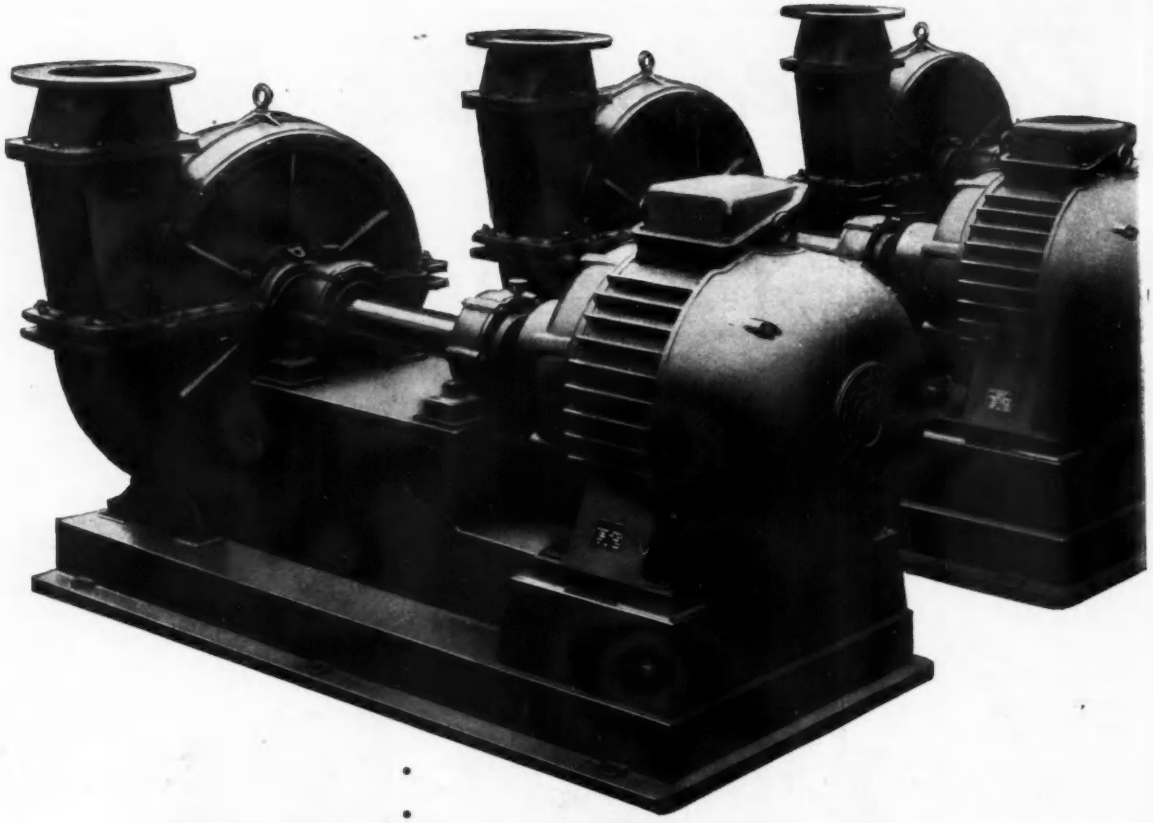
INERT GAS GENERATORS

Designed to meet the need for purging Gas Works plant, and mains on the District. A procedure increasingly recognised by the Industry as desirable for both repair work and for routine purifier operation.

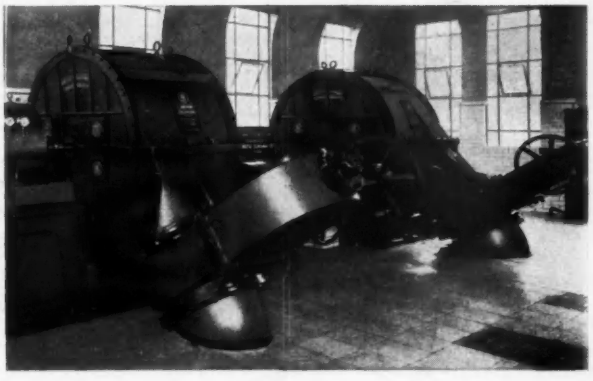
FOUNDED 1850 HOLMES HUDDERSFIELD

W. C. HOLMES & CO LTD · TURNBRIDGE · HUDDERSFIELD

C457



Gas Boosters?



EXAMPLES of gas boosting fans with cast iron casings are illustrated here. They represent the results of special attention to the design and development of robust, trouble-free boosters over the years. This experience provides fans for handling volumes of 5,000 to 1½ million cubic feet of gas per hour at pressures up to several pounds per square inch.
When the time comes you'll find there's no easier way to solve your air or gas moving problem than to put it to Keith Blackman.

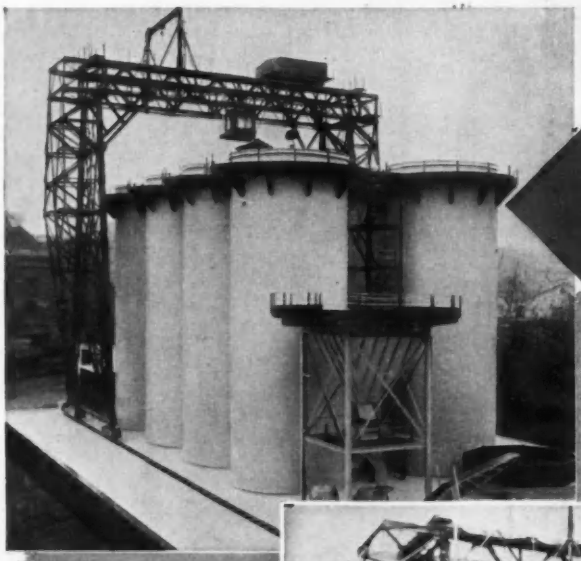
contact **Keith Blackman Ltd**
MILL MEAD ROAD · LONDON · N17 · TOTtenham 4522

T.A.7225/61

Registered as a Newspaper. Printed by STRAKER BROTHERS LTD., E.C.2 for WALTER KING LIMITED, 11, BOLT COURT, FLEET ST., LONDON, E.C.4., Wednesday, November 9, 195

CLEAN AIR
GLOVER-WEST
CONTINUOUS VERTICAL RETORTS
The York installation of Glover-West retorts has a nominal daily capacity of 2,400,000 cu. ft of gas.
York Minster (Photo by courtesy of the Gas Council)

WEST'S GAS IMPROVEMENT CO. LTD MILES PLATTING · MANCHESTER 10
London: Columbia House, Aldwych, W.C.2 C.O.L. Div: Chandos House, Buckingham Gate, S.W.1



Tower Purifiers

from the Model...

These Tower Purifiers recently completed at Dover have a capacity of 10 mill. cu. ft. per day with provision for future extensions as shewn in the model. We should be happy to consult with you on any Gas Purification requirements you may have.

...to the Finished Plant

(Photograph by courtesy of South Eastern Gas Board, Dover.)

NEWTON CHAMBERS

& CO. LTD., THORNCLIFFE, Nr. SHEFFIELD